IN THE UNITED STATES DISTRICT COURT

DISTRICT OF MINNESOTA

IN RE PORK ANTITRUST LITIGATION	No. 0:18-cv-01776-JRT-JFD
This Document Relates To: ALL DIRECT PURCHASER PLAINTIFF ACTIONS	

EXPERT REPLY REPORT

of

Russell W. Mangum III, Ph.D.

Regarding Class Certification

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I. INTRODUCTION

A. My Education, Experience, and Qualifications

1.   I am the Executive Vice President at Cirque Analytics. Cirque Analytics is an economic consulting firm that provides economic, financial, and statistical research and analysis to private and public sector clients.

2.   I hold a Ph.D. and a M.A. in economics from the University of Southern California, and a B.A. in economics, with honors, from California State University, Fullerton. I have been using econometrics and economic analysis to evaluate and model the effects of anticompetitive behavior for over 25 years. From 1995 to 1998, I served as a staff economist at the United States Federal Trade Commission, in the Antitrust Division of the Bureau of Economics. While at the FTC, I conducted economic investigations into proposed mergers and other business practices with potentially anticompetitive effects, including investigations into coordinated interactions, boycotts, and price fixing. From 1998 through 2001, I was an economist at Nathan Associates (my first tenure at Nathan Associates), where I served as a consulting and testifying economist on various litigation assignments, including antitrust and class action antitrust matters. From 2001 through 2007, I was an economist at PricewaterhouseCoopers and Analysis Group Inc., where I acted as a consulting and testifying economist on various litigation matters, including those related to commercial disputes, alleged intellectual property infringement, and alleged antitrust violations. From 2007 to 2021, I served as an economist and firm officer at Nathan Associates (my second tenure at Nathan Associates), where I acted as a consulting and testifying economist on various litigation matters, including those related to alleged antitrust violations, commercial disputes, and alleged intellectual property infringement. In April 2021, I moved into my current role at Cirque Analytics.

3.   I am or have been a member of several professional associations, including the American Economic Association, the Intellectual Property Law Association, and the American Bar Association, and I have served as the Chair of the Orange County chapter of the Licensing Executives Society. I have taught courses in undergraduate and graduate economics and econometrics at Johns Hopkins University, the University of Southern California, Pepperdine University, and recently retired as a Professor in the School of Business and Economics at Concordia University Irvine.

4. My experience in economic analysis includes evaluation of the potentially anticompetitive effects of business conduct, including the measurement of the effects of such conduct. In conducting such analyses, I have often analyzed numerous relevant markets (both geographic and product markets), barriers to entry, market power, and monopolization. I have used databases related to purchase transactions, invoices, and company financial performance to specify econometric models of pricing and costs, and to estimate the impacts of business combinations and cartel behavior on both direct and indirect purchasers.

5. Cirque Analytics currently charges its usual and customary rate of $700 per hour for my work in this matter. Professional staff members employed by Cirque Analytics also assist me. Neither my compensation nor that of Cirque Analytics is contingent upon the outcome of this case.

6. My curriculum vitae is attached to this declaration as **Appendix A**. Also included in **Appendix A** is a list of the matters in which I have testified in the past four years, along with a list of my publications for at least the past ten years.

B. Assignment

7. On May 2, 2022, I submitted an expert report (the "Mangum Report") in this matter on behalf of DPPs.[1] Subsequently, on July 13, 2022, I gave deposition testimony regarding the opinions expressed in the Mangum Report.[2]

8. My assignment in the Mangum Report was as follows:

    i.   Analyze whether the pork industry in the United States had structural characteristics over the relevant timeframe that economic theory would suggest made it conducive to the formation and success of the alleged conspiracy.

    ii. Determine whether there is common evidence demonstrating that all, or nearly all, DPPs were impacted by the alleged conspiracy.

    iii. Specify a methodology (or methodologies) by which any Class-wide damages that may have resulted from the alleged conspiracy can be accurately determined.

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[1]   Expert Report of Russell W. Mangum, Ph.D., May 2, 2022 ("Mangum Report").
[2]   Deposition of Russell W. Mangum, Ph.D., July 13, 2022.

9. On August 24, 2022, Defendants' experts Dr. Laila Haider and Dr. James Mintert submitted reports (the "Haider Report" and "Mintert Report," respectively) in which they respond to certain opinions and analyses I conducted in this case.[3] While the Haider and Mintert Reports contain opinions and analyses directly in response to the Mangum Report, they also include numerous opinions and analyses responding to the July 29, 2022, report submitted by Dr. Michael Williams on behalf of the Commercial and Institutional Indirect Purchaser Plaintiffs ("CIIPPs"), and the May 2, 2022, report submitted by Dr. Hal Singer on behalf of the Consumer Indirect Purchaser Plaintiffs ("Consumer IPPs").[4] I have been asked for DPPs to review the Haider and Mintert Reports and respond where appropriate.

C. Summary of Conclusions

10. In the Mangum Report, I concluded that common evidence could be used to determine (1) whether Class members paid artificially inflated prices for pork products, and (2) the amount by which the prices paid by Class members exceeded those that would have prevailed but-for the alleged conspiracy. My specific conclusions were as follows:

    i. The structure of the pork packing market was conducive to the formation and success of the alleged conspiracy. This flows from numerous facts, including: (i) Defendants collectively dominate the pork packing market, with their joint market share ranging between 80% and 90% throughout the relevant time period; (ii) there are relatively few large pork packers in the United States, which makes coordination and enforcement of a conspiracy easier and more likely to succeed; (iii) the highly concentrated nature of the pork market, combined with Defendants' participation in numerous trade organizations, led to an environment in which Defendants' executives and other key personnel had numerous opportunities to communicate with each other; (iv) there were significant barriers to entry in the pork packing market throughout the relevant time period, which also facilitated the formation, maintenance, and success of the alleged

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3   Expert Report of Dr. Laila Haider, Aug. 24, 2022 ("Haider Report"); Expert Report of James Mintert, Ph.D., Aug. 24, 2022 ("Mintert Report").

4   Corrected Expert Report of Michael A. Williams, Ph.D., July 29, 2022 ("Williams Report"); Declaration of Hal J. Singer, Ph.D., in Support of Consumer Indirect Purchaser Plaintiffs' Motion for Class Certification, May 2, 2022 ("Singer Report").

conspiracy; (v) the commodity nature of pork products, as recognized by industry participants, including analysts, purchasers, and Defendants themselves.

   ii.   The results of my econometric analysis, which shows artificially inflated prices during the relevant time period, is consistent with the existence of the alleged conspiracy.

   iii.   Common evidence demonstrates that all, or nearly all, members of the DPP Class paid artificially inflated prices on purchases of pork products. This conclusion was based on (i) my overcharge regression analysis; (ii) the presence of structural characteristics that tended to prevent customers from avoiding the overcharge; (iii) the widespread use of market benchmarks such as the USDA pork cutout that limited the ability of DPPs to avoid the impact on pork prices from reduced pork supplies; (iv) correlation analysis across Defendants, geographic locations, and customers, which showed that prices were affected by common factors; and (v) the nature of joint-supply, whereby supply cuts would lead to lower supply and higher prices of all products.

   iv.   There are feasible and reliable methods to measure Class-wide impact and damages on a common, formulaic basis. Class-wide damages during the Class Period are just over $5 billion. This conclusion was based on my estimates of overcharge percentages calculated for each relevant pork product category (Bacon, Belly, Fresh Ham, Loins, Ribs and Shoulders) and the calculated commerce for each.[5]

11.   As noted above, I have been asked to review Dr. Haider's and Dr. Mintert's opinions and respond as they pertain to the Mangum Report. After reviewing the Haider Report, the Mintert Report, and the deposition testimony for both Defendants' experts, I affirm all of the opinions and analyses I presented in the Mangum Report and summarized above. I explain in this report ("Mangum Reply Report") how Defendants' experts' attempts to rebut my opinions fall short, and why nothing in their reports causes me to change my conclusions that: (i) industry characteristics facilitated the formation and success of the alleged conspiracy; (ii) pork supply was artificially reduced and pork prices artificially inflated during the Class Period; (iii) all, or

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[5]   Using regression analysis, I have calculated the amount by which Class members during the Class Period were overcharged as 13.9% on Bacon; 19.1% on Belly; 4.7% on Fresh Ham; 4.3% on Loins; 8.0% on Ribs; and 11.5% on Shoulders. I have estimated the relevant Class commerce to be $51,378,285,595. See Mangum Report, Sections V and VI.

nearly all, direct purchaser Class members paid artificially inflated prices on purchases of pork products, and (iv) that this Class-wide impact is measurable and amounts to just over $5 billion in Class-wide damages.

12.   None of the analyses in Dr. Haider's or Dr. Mintert's reports undermines the conclusions and results set forth in the Mangum report, including my proposed damages models, and my finding that economic evidence common to the proposed class demonstrates that all or nearly all DPP Class members paid artificially inflated prices as a result of the alleged conspiracy. Specifically:

   i.   Defendants' experts largely ignore the structural characteristics of the pork industry that make it conducive to a successful conspiracy and generally prevent individual customers from avoiding impact. Their attempts to challenge the conclusion that Defendants influenced the hog market are misguided and contradicted by record evidence.

   ii.   In particular, Defendants' experts draw flawed conclusions about the "independence" of hog growers, the power dynamics of hog contracts, and the ability of Defendants to influence the supply of hogs in general.

   iii.   Defendants' experts' analysis and opinions related to pork exports are flawed, misleading, and fundamentally do not address, much less refute, any of the evidence presented in the Mangum Report. Neither Dr. Mintert nor Dr. Haider present any evidence to contradict my finding that Defendants had the ability to use export markets to reduce domestic pork supplies and increase domestic prices, or the evidence that Defendants explicitly used export markets for this purpose.

   iv.   The correlation analysis in the Mangum Report is a robust method to assess whether the prices of direct purchasers are affected by common market forces. Dr. Haider's flawed "price response" analysis does not undermine this analysis or my conclusion of common impact.

   v.   Dr. Haider's "top purchaser" analysis is misleading and econometrically unsupported. In addition, despite positioning this analysis as evidence against common impact, Dr. Haider's results, with no correction at all, ultimately point strongly in favor of such

a finding. After making a minor correction to Dr. Haider's analysis, her methodology leads to even greater and clearer support for a finding of common impact.

vi.   Dr. Haider does not dispute the use of a reduced-form regression model to determine damages resulting from the alleged conspiracy, nor does she dispute my methods for calculating class-wide sales.

vii.   While Dr. Haider attempts to undermine certain results of my regression models by adding or changing certain variables, none of these modifications have a sound economic or econometric basis. Therefore, they do not undermine my results or my methodology, as I will show throughout this reply report. My overcharge models include appropriate explanatory variables that control for non-conspiratorial factors that influence pork prices. Dr. Haider provides no alternative models to control for any other factors which could explain the overcharges that I find, but simply conducts irrelevant "tests" without a sound economic basis to support her claim that my overcharge models are not reliable.

viii. Dr. Haider misconstrues my predicted but-for price analysis, and her misguided criticisms are based on flawed logic.

ix.   Reaching and supporting my opinions and conclusions detailed in the Mangum Report do not require me to estimate but-for levels of sow herds, hog production, or exports. As a matter of economics, the overcharges estimated by my econometric models are consistent with supply restraints, since artificially inflated prices indicate artificially lower supply.

D. Information and Materials Relied Upon

13.   In preparing this report and the Mangum Report, I (and those working under my direction) relied on numerous common sources of data and information concerning the pork industry detailed in the report and supporting materials, including:

- The Complaint and other documents filed with the Court;

- Voluminous data and documents produced by Defendant packers, including transaction data and internal business records;[6]

- Data and documents produced by Defendant Agri Stats;[7]

- Publicly available data and information, including data from the USDA;

- Transcripts of the deposition testimony of a number of witnesses;

- Economic and industry research and literature;

- Defendants' expert reports and workpapers.

14.   Since submitting the Mangum Report, I have received additional documents, data and information. A list of the materials I relied upon in forming my opinions is provided in **Appendix B** to this report, or elsewhere in this report. The conclusions reached in this report are based on the information and data that have been reviewed to date. In the event that additional data or information becomes available, whether through discovery or other sources, I reserve the right to update my analysis and conclusions appropriately.

E. Case Background – Parties, Allegations, Class Definition, and Industry Practices

15.   The Mangum Report includes discussions of the parties at issue in this litigation, the allegations, the proposed Class Definition, and other elements of case background.[8] I incorporate those discussions by reference and do not revisit them in this report, except where necessary in responding to Defendants' experts.

II. CLASSWIDE EVIDENCE IS CONSISTENT WITH DEFENDANTS' ARTIFICIAL INFLATION OF PORK PRODUCT PRICES DURING THE CLASS PERIOD

16.   Defendants are alleged to have artificially inflated the price of pork products in the U.S. including the following mechanisms: 1) restricting the domestic supply of pork and 2) exchanging detailed, non-public information about prices, bids, capacity, sales volume and demand, including through Defendant Agri Stats.[9] I examined the pork market characteristics

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[6]   The transaction data produced by Defendants were compiled and cleaned by the consulting firm OSKR. The staff working under my direction reviewed the data cleaning computer programs that OSKR provided.

[7]   The data produced by Agri Stats were compiled and cleaned by the consulting firm OSKR. The staff working under my direction reviewed the data cleaning computer programs that OSKR provided.

[8]   Mangum Report, Sections I and II.

[9]   Mangum Report, ¶13. Direct Purchaser Plaintiffs' Third Amended and Consolidated Class Action Complaint, Jan. 15, 2020 (hereinafter "Complaint"), Sections IV and V.

and structure as well as Defendants' behavior and performance, and concluded that there exists common economic evidence which supports the existence of the alleged conspiracy. In the Mangum Report, I detailed the structural characteristics of the pork market that facilitated the alleged conspiracy, including (i) that Defendants dominated production of pork; (ii) Defendants' control of the upstream hog supply; (iii) the commodity nature of pork products; (iv) the high barriers to entry into the pork market; and (v) the existence of opportunities to form, monitor and enforce the alleged conspiracy. I also presented common empirical evidence that was consistent with the domestic supply restriction allegations, specifically (i) the increase in exports, and (ii) the artificially inflated prices paid for pork products.

17. Dr. Haider and Dr. Mintert largely ignore my conclusions in the Mangum Report regarding the structural characteristics of the pork market, and focuses almost entirely on the upstream hog market.[10] Defendants' experts' claim that Defendants could not affect the supply of hogs, because they a) are not all vertically integrated, and b) collectively hold less than half of the hog market share.[11] While I disagree with Defendants' experts' overarching conclusions about Defendants' ability to exert influence in the hog market, it is also important to note that their focus on the upstream hog market is a red herring, because the pork market, and specifically the prices paid for pork products, is the focus of the allegations and my analysis.

18. In the Mangum Report, I demonstrated that Defendants' exports of pork increased significantly throughout the Conspiracy Period. I also showed that much of the growth in U.S. pork production was ultimately sent to export markets, in the context of my analysis suggesting that export prices were lower than domestic prices. I further discussed evidence from Defendants indicating that the purpose, and net effect, of increasing exports was an increase in domestic pork prices.[12] While Dr. Haider and Dr. Mintert attempt to critique my conclusions regarding exports of pork products, they ultimately provide no analysis or information that is inconsistent with my opinions or the allegations in this case. In particular, neither of Defendants' experts

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[10] Haider Report, Section V; Mintert Report, Sections III, IV, and V. Dr. Mintert briefly discusses some "determinants of processing capacity" in his report, but only mentions inspection and facility regulations, labor supplies, and hog supplies (Mintert Report, ¶¶35–38). Labor shortages and government regulations would constitute barriers to entry that would further enhance the ability of a cartel to maintain supracompetitive prices.

[11] Haider Report, Section V.A.3.

[12] Mangum Report, Section II.F.3.

responds to, much less refutes, the evidence that increases in exports were undertaken by Defendants for the express purpose of increasing domestic prices. Nor does either Defense expert respond to, or refute, my analysis of domestic and export pricing. In any event, even if Defendants' experts' criticisms were valid (which they are not), they are not unique to any DPP Class member, because their characterizations of the pork and hog markets are equally applicable to all purchasers of pork products. In other words, Defendants' experts' criticisms here have no bearing on the question of common impact.

A. Defendants' Experts Either Ignore or Come to Faulty Conclusions Regarding the Structural Characteristics of the Pork Industry

19.   Plaintiffs allege a conspiracy to fix the price of pork in the United States.[13] As such, the Mangum Report focused on the alleged conspiracy and the relevant structure and characteristics of the pork market.

20.   I discussed in detail in the Mangum Report economic evidence, common to the class as a whole, that is consistent with the existence of the alleged conspiracy to fix the pork prices.[14] Specifically, I explained that structural characteristics of the pork market a) facilitated the success of the alleged conspiracy, and b) tended to prevent individual customers from being able to avoid impact from the alleged conspiracy. These structural characteristics include (i) that Defendants dominated pork production; (ii) Defendants exerted control in the upstream hog supply; (iii) the commodity nature of pork products; (iv) the high barriers to entry into the pork market; and (v) the existence of opportunities to form, monitor and enforce the alleged conspiracy.

21.   Rather than meaningfully addressing the structural characteristics of the pork market, Dr. Haider and Dr. Mintert ignore the discussion and evidence presented in the Mangum Report and instead focus on the upstream hog market. In particular, Defendants' experts opine that Defendants did not control the supply of hogs.[15] Neither expert provides a critique of my assessment of the market at issue (the pork market); instead, both proffer strawman arguments

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[13]   See Complaint, ¶¶2–7.

[14]   Mangum Report, Section III.

[15]   Haider Report, Section V.A; Mintert Report, Section III.C.

based on the false claim that Defendants need to directly own and produce all of their own hogs in order to exert influence on the hog market.

22.   I reiterate in the sections below how the characteristics of the pork market that Defendants' experts either ignore or agree with are important evidence in support of facilitating the alleged conspiracy and preventing individual customers from avoiding its effects. I also address shortcomings and flaws in Defendants' experts' opinions regarding Defendants' influence in the hog market.

1. Defendants' Experts Fail to Address My Conclusions Regarding the Structural Characteristics of the Pork Market

23.   Defendants' experts focus on the upstream hog market and fail to address, much less rebut, my discussion of, and conclusions regarding, the downstream pork market. This is noteworthy because my analysis of the pork market is central to my conclusion that the alleged conspiracy would have common impact (*i.e.*, it would affect prices paid by all or nearly all DPP Class members). I revisit these characteristics of the pork market in the sections below in the context of Defendants' experts' reports.

a. The Pork Market is Dominated by Defendants

24.   I explained in the Mangum Report that Defendants collectively control the vast majority of pork production capacity, and how common measures of market concentration indicate that Defendants wield extraordinary market power. This supports my conclusion of common impact, because it means that virtually all the pork that DPPs purchased during the Conspiracy Period came from Defendants. In other words, even if a pork customer was aware of the alleged price-fixing conspiracy, it would have been difficult, if not impossible, to avoid purchasing Defendants' pork products at all, let alone for the entire duration of the Class Period.[16]

25.   Neither Dr. Haider nor Dr. Mintert disputes Defendants' collective domination of the pork market.[17]

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[16]   Mangum Report, Section III.A.1.

[17]   Deposition of Dr. Laila Haider, Nov. 3, 2022 ("Haider Deposition"), pp. 100:25–101:15; Deposition of Dr. James Mintert ("Mintert Deposition"), Nov. 9, 2022, pp. 60:12–62:17.

b.   *Commodity-like Nature of Pork Products*

26.   I explained in the Mangum Report that a) the relevant pork products are commodity-like in nature, b) Defendants and customers considered them commodities, and c) the actions of upstream hog suppliers are consistent with pork products being commodity-like. The commodity nature of pork products means that price is a function of industry supply relative to demand and that the price a particular processor[18] receives is a function of the cumulative supply decisions of all processors rather than just that processor.[19] I further explained that the commodity nature of pork products provides an incentive to collectively agree to reduce total supply relative to what it would have been to enhance industry profits.[20] Typically, when a product is commodity-like in nature, competition is based principally on price. This makes coordination and monitoring easier, because cartel members can more readily monitor and identify deviations from an agreement. This is because, with a high degree of homogeneity, there are fewer dimensions along which competitors must coordinate. The characterization of a product as a "commodity" does not mean that there are no differences in the product across categories or dimensions, but rather that what matters is that an industry is more susceptible to cartel behavior if, as was the case here, the output of one supplier may be generally substituted with the output of another supplier within the same category or product dimension. In addition, the commodity nature of pork products is relevant for my finding that all or nearly all purchasers would be impacted since the increase in market prices caused by a supply restriction leads to widespread increases for individual purchasers. Therefore, the commodity-like nature both of pork products, and the upstream hogs, would have facilitated the formation and maintenance of the alleged conspiracy, including its supply constraint mechanism.[21]

27.   Neither Dr. Haider nor Dr. Mintert disputes the commodity nature of pork products or hogs.

c.   *There are Significant Barriers to Entry in the Pork Market*

28.   I described in the Mangum Report the significant barriers to entry in the pork market, including substantial facility costs, vertical integration, contract commitments with hog growers, and

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[18]   In this report, I use the terms "processor" and "packer" interchangeably in reference to entities like Defendants.

[19]   Mangum Report, Section III.A.3.

[20]   Mangum Report, ¶119.

[21]   Mangum Report, Section III.A.3.

regulatory hurdles. Such barriers facilitated the formation and maintenance of the alleged conspiracy by preventing or hindering the entry of other firms that could have eroded the inflated profits of a cartel.

29. Neither Dr. Haider nor Dr. Mintert disputes my conclusion that there are significant barriers to entry in the pork market.[22]

d.   *Opportunities to Collude*

30. I noted in the Mangum Report that Defendants have frequent opportunities to collude, through intercompany purchases, industry organizations and events, and other interactions.[23] Such opportunities can facilitate the formation of a conspiracy, as well as increase the likelihood of a cartel's success or maintenance by providing additional means of monitoring and enforcing an agreement.[24]

31. Neither Dr. Haider nor Dr. Mintert disputes the existence of these opportunities to collude.

2.   *Defendants Possessed Significant Influence in the Hog Market*

32. In their reports, Dr. Haider and Dr. Mintert both argue that I failed to address elements of the upstream hog market as they pertain to the alleged conspiracy.[25] In particular, Defendants' experts raise arguments about Defendants' differing degrees of vertical integration, the nature of hog procurement contracts, and the role of independent hog growers' decisions in the marketplace.[26] These arguments collectively appear to be aimed at diminishing the role that

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[22]   While not specifically addressing barriers to entry, both experts make reference to small increases in capacity made by Defendants over the course of the Conspiracy Period, and both also reference the entry of Prestage into the packing market. I address these issues more fully in a later section of this report. However, it is worth noting that Prestage's entry is clearly exceptional—they had been a long-term major industry participant for years, and thus entry was a more logical step toward "added value through participation in an additional area of the vertical pork industry." Further, and more importantly, Prestage explained that its decision to enter the packing market was driven by Defendants' inability (or unwillingness) to expand their own capacity sufficiently to meet the industry's and growers' needs, as well as a pricing power imbalance that had resulted from Defendants' control of the pork market. Sharon Spielman, "How Prestage Foods of Iowa Built a State-of-the-Art Pork Processing Plant," *Food Engineering*, Dec. 9, 2019, https://www.foodengineeringmag.com/articles/98612-prestage-farms-built-a-state-of-the-art-pork-processing-plant-in-northwest-iowa.

[23]   Mangum Report, Section III.A.5.

[24]   *Id*.

[25]   Haider Report, Section V.A; Mintert Report, Section III.C–D and Section IV.

[26]   *Id*.

Defendants play in the hog market. As an initial matter, these arguments are misguided: the alleged conspiracy pertains to prices for pork products, not hogs. Assessing anticompetitive impact need not involve a corresponding analysis of upstream input markets or other methods of indirect analysis, nor does it require that the alleged conspirators be vertically integrated.[27] For example, a conspiracy to fix the prices of computer components (such as DRAM) does not require that DRAM manufacturers produce all of the raw materials used to make chips in-house. An appropriate determination of anticompetitive impact in the pork market can be conducted directly through analysis of pork prices, as I showed in the Mangum Report.[28] I analyzed Defendants' role and influence in the hog market in the Mangum Report, but Defendants' experts now claim that my analysis was insufficient to establish the impact of a conspiracy in the hog market itself—a conspiracy different from the one alleged by DPPs in this case.[29]

33. Moreover, Defendants' experts rely on information I presented in the Mangum Report, but simply come to different (and flawed) conclusions on the basis of this information. For example, Defendants' experts and I both discussed how Defendants exhibit varying levels of vertical integration, and that virtually all hogs in the United States are sold through contracts with growers. Our disagreement is only about the implications of these facts. In the sections below, I respond to some of Defendants' experts' main criticisms.

a. Defendants' Varying Degrees of Vertical Integration Do Not Affect My Opinions or Analysis

34. Dr. Haider and Dr. Mintert repeatedly argue that Defendants do not exert control in the upstream hog market. One primary reason cited by Dr. Haider and Dr. Mintert is that Defendants' market share for upstream hogs is lower than it is for downstream pork products.[30]

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[27] I have previously conducted an anticompetitive analysis of the packaged seafood (*i.e.*, canned and pouch tuna) market. Packaged tuna is a commodity-like product comprised almost entirely of fresh or frozen tuna filets that are minced and cooked during the packaging process. The United States market for packaged tuna is dominated by three large firms, only one of which was vertically integrated during the period of investigation. My analysis in that case did not require an investigation into the upstream tuna fishing market in order to reach a finding of common impact. I have also conducted analyses and reached similar conclusions in other industries.

[28] Mangum Report, Section IV.D.

[29] Mangum Report, Section III.A.2.

[30] Haider Report, ¶¶60 and 64; Mintert Report, ¶48.

As an initial matter, as I explained in the Mangum Report, Defendants exhibit varying degrees of vertical integration.[31] Some, like Seaboard and Clemens, are highly vertically integrated—meaning that they own a large percentage of the hogs they slaughter.[32] Others, like Tyson and Hormel, have adopted a business model that relies on contracting with hog growers to obtain the vast majority of their hogs.[33]

35.   Defendants' experts appear to equate vertical integration and market power, but this is a false equivalency. Vertical integration may ultimately enhance a firm's market power, but it is not necessary for a firm to be fully vertically integrated in order to have market power in the downstream market.[34] Defendants in this case exert control or influence in the upstream hog market in several different ways. First, while they are not fully vertically integrated, Defendants do collectively possess a large share of the upstream hog market. Therefore, they have the ability to directly influence the volume of hogs available for slaughter through their own growing decisions. While a large share of a market may make influencing prices in that market easier, it is not necessarily required. For example, oil and gasoline prices in the United States have increased significantly in the wake of import bans on Russian energy, despite the fact that Russia only produces about 10% of the world's oil, and only about 3% of the oil used in the United States.[35] Second, Defendants are able to use contracts to exert influence in the hog market (as discussed below). While growers may be "independent" in certain ways, they are nevertheless subject to Defendants' practices, preferences, and decisions in critical ways. Third, Defendants have significant buying power because they represent nearly the entirety of the market demand curve for hogs.

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[31]   Mangum Report, ¶46–55 and ¶¶108–118.

[32]   Mangum Report, ¶116.

[33]   Mangum Report, ¶118.

[34]   It is also not the case that vertical integration necessarily leads to market power. For example, consider a small independent hog grower that builds a facility to slaughter hogs and pack pork products. The mere fact that the grower now participates in multiple stages of pork production does not grant it market power. A 2005 study of U.S. food manufacturing found that vertical integration alone did not increase market power See Sanjib Bhuyan, "Does Vertical Integration Effect Market Power? Evidence from U.S. Food Manufacturing Industries," *Journal of Agricultural and Applied Economics* 37, no. 1 (Apr. 2005): 263–276.

[35]   *New York Times,* "Why Russian Oil and Gas Matter to the Global Economy," Mar. 10, 2022, *available at* https://www.nytimes.com/explain/2022/03/09/business/gas-oil-russia-ukraine.

b. *Defendants' Experts Mischaracterize both Hog Contracts and My Opinions and Analysis of Hog Contracts*

36.   In the Mangum Report, I explained how Defendants' use of hog contracts helped them approximate vertical integration and give them influence in the hog market.[36] In response, Defendants' experts argue that hog contracts grant growers flexibility in terms of delivery dates, weights, and sales of excess quantities.[37] While I do not dispute hog growers' technical flexibility on these issues, a review of hog contracts produced in this case demonstrates that hog contracts impose significant restraints on growers.

37.   In their reports, Defendants' experts highlight the benefits that hog contracts provide to Defendants and emphasize certain contractual elements that appear to grant control to hog growers (instead of processors).[38]

38.   For example, Defendants' experts discuss how hog contracts benefit processors like Defendants because they provide a steady supply of hogs.[39] I agree that it would be economically irrational for processors to use hog contracts—especially long-term contracts— if they did not receive the intended benefit (a supply of hogs) from doing so. However, the fact that processors benefit from a steady supply of hogs is irrelevant to the question of whether Defendants are able to exert influence or control in the hog market through these contracts.

39.   Similarly, while Defendants' experts point out that marketing contracts do not always grant Defendants ownership of hogs prior to marketing, there is no reason why this would be required. That is, a contract does not need to grant ownership to Defendants in order for Defendants to exert control or influence in the hog market. In fact, Defendants' power in the hog market comes (in part) from their buyer power, not the ownership details of hog contracts.

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[36]   Mangum Report, ¶111. *See also* Sanjib Bhuyan, "Does Vertical Integration Effect Market Power? Evidence from U.S. Food Manufacturing Industries," *Journal of Agricultural and Applied Economics* 37, no. 1 (Apr. 2005) ("Some form of vertical coordination, whether in the form of contracts or outright ownership, is an integral part of the U.S. food manufacturing industries. As the U.S. food system becomes more and more consumer driven, vertical coordination, either through outright ownership integration (*i.e.*, mergers) or though contracts, as a business strategy has become increasingly important because it allows both farms and food manufacturers to manage and customize their production according to market needs.").

[37]   Mintert Report, Section III.C.3.

[38]   Mintert Report, ¶¶58–78.

[39]   Haider Report, ¶67; Mintert Report, ¶64.

Defendants' experts similarly point out that hog contracts do not always require exclusive relationships with specific processors (*i.e.*, growers are allowed to market hogs to multiple processors).[40] However non-exclusivity clauses in hog contracts do not imply a lack of control or influence among processors, because it is not necessarily the case that a hog grower even has the ability to contract with multiple processors. Even if a grower does have the geographic coverage and the hog production volume to make selling to multiple processors viable, the grower's "choices" are still limited to a small number of Defendants, all of which are alleged to be part of a conspiracy.[41] Indeed, Meyer and Goodwin wrote that, during times of high processor utilization (which Dr. Mintert claims was the case throughout the alleged conspiracy), "the price of negotiated pigs could be pushed lower by packers since there were few alternative outlets for these 'extra' pigs relative to supplies committed to packers through contracts."[42]

40.   In short, Defendants possess significant influence in the upstream hog market through long-term (and short-term) marketing contracts. Hog growers, like contract manufacturers, do not decide how many hogs to grow in a vacuum. Instead, they necessarily and logically rely on the production decisions of processors to inform their own growing decisions. Defendants' demand for hogs is, effectively, the market demand curve, and therefore if Defendants'

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[40]   Minter Report, ¶¶66–69; Haider Report, ¶68. Dr. Mintert discusses an example where Clemens asserted a breach of contract against grower Franklin Farms LLC ("Franklin") due Franklin not meeting the required volume in 2009. Dr. Mintert quotes Clemens' Dan Groff to suggest that the company never worked with Franklin again. Mintert Report, ¶76. However, testimony from Franklin contradicts Mr. Groff's recollection. According to Mark Bricker, Franklin stopped supplying Clemens for a period in 2013–2015 (not in 2009), but only because it received a better opportunity from Smithfield (Deposition of Mark Bricker, Aug. 29, 2022 ("Bricker Deposition"), pp. 23:25–26:6 and 70:18-71:4). According to Mr. Bricker, 90–95% of Franklin's revenue is attributable to Clemens—it sold hogs exclusively to Clemens from 1999–2013 and from 2016–2020. See Bricker Deposition, pp. 74:17–22 and 71:21–72:20.

[41]   Trist and Wise note ". . . all of these market pressures on independent hog farmers have led many of them to given up their independence by entering production or marketing contracts with one of the few large packers in their area. . . . Contracts present a number of opportunities for packers to exercise buyer power. The first is the power imbalance between the contracting parties. Packers have a large number of farmers to choose from, while many farmers have just one or two packers offering them contracts." Timothy Wise and Sarah Trist, "Buyer Power in U.S. Hog Markets: A Critical Review of the Literature," Global Development and Environment Institute, Working Paper No. 10-04, Aug. 2010, https://ageconsearch.umn.edu/record/179085 (hereinafter "Trist and Wise (2010)"), pp. 10–11.

[42]   Steve R. Meyer and Barry Goodwin, "Structure and Importance of the U.S. Pork Industry," *available at* https://nppc.org/wp-content/uploads/2021/06/Competition_Paper_FINALWD.pdf ("Meyer and Goodwin"), p. 19.

demand for hogs changes (due to a conspiracy or otherwise), the market demand curve will also change. Thus, Defendants are able, over time, to influence increases and decreases in hog production through their management of hog contracts and exertion of market power over hog producers.

41.   Additionally, while their collective share of the hog market is lower than their share of the pork market, Defendants still possess a sufficiently large share of the former to influence supply through their own breeding practices.[43] Indeed, the Defendants comprise some of the largest hog producers in the United States and account for at least 25% of the market.[44] This provided Defendants with significant control over the hog market and the ability to implement significant reductions in the supply of hogs. Industry coverage and commentary establishes that Defendants are seen as the "big boys" in the hog market and that they have the ability to significantly influence outcomes.[45]

(i)   Packers Benefit from Right of First Refusal Clauses in Hog Contracts

42.   Dr. Mintert notes that many hog contracts include "right of first refusal" ("ROFR") clauses.[46] ROFR clauses may matter in situations where a grower has raised hogs in excess of the contracted volume and seeks to market them. In such situations, ROFR clauses often grant the buyer the right, but not the obligation, to purchase the grower's excess quantities. Dr. Mintert attempts to portray such clauses as evidence of seller flexibility or freedom—he notes that, if the buyer does not exercise its ROFR, the seller is then typically free to contract with another buyer for the excess quantity.[47] While this is technically true, it ignores the much larger point that a ROFR clause is inherently and indisputably a restriction on the seller that favors the buyer.

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[43]   According to Dr. Mintert, Defendants collectively held approximately 30 % of the hog market (Mintert Report, ¶57). Dr. Haider states that packer-owned hogs represented "roughly one-third of total hogs slaughtered throughout the alleged conduct period." (Haider Report, ¶58).

[44]   *See* Mintert Exhibit 5; Mintert Deposition, p. 105.

[45]   I discussed some industry coverage of Defendants' and other growers' cuts in the Mangum Report at ¶¶74–79.

[46]   See, *e.g.*, Mintert Report, ¶¶70–73.

[47]   *Id*.

43.   Dr. Mintert discusses a similar clause in a contract between Seaboard and Prestage, but appears to have misread the agreement and therefore reached faulty conclusions.[48] Specifically, Dr. Mintert notes that the contract appears to include a ROFR for Seaboard on additional hogs, but then cites a passage which he concludes is less restrictive.[49] It appears that Dr. Mintert is conflating two different clauses, one of which relates to "Purchase of Market Hogs" (Section 3.01) and a separate clause that deals with "Additional Production" (Section 3.02).[50] Section 3.01 requires Prestage to provide Seaboard with all of the hogs it produces until their maximum agreed-upon supply has been reached. The same section also provides Seaboard with the ROFR for any additional hogs produced by Prestage above and beyond the maximum agreed-upon quantity.[51] In contrast, Section 3.02 applies only to a situation in which Prestage expands its operations (which would, in theory, allow it to increase its overall production). Even here, the agreement states that [Prestage] shall notify [Seaboard] in the event [Prestage] expands its operations to produce additional Market Hogs (the "Expanded Production")."[52] It continues: "[Seaboard] is not obligated to purchase any or all of the Expanded Production, and [Producer] is not obligated to sell any or all of the Expanded Production to [Seaboard], nor shall such hogs be subject to any right of first refusal set forth in Section 3.01."[53] Critically, Section 3.02 appears to only apply to situations in which Prestage expands its production capacity—not simply expands its hog production.[54] Thus, it appears to have no relevance to Section 3.01, which grants Seaboard the ROFR to excess quantities of hogs—it is merely a carve-out for a facility expansion that may (or may not ever) occur.

44.   In summary, Defendants' experts have misconstrued ROFR clauses and incorrectly portrayed them as benefits to growers, when they are plainly a source of value to the buyer (*e.g.*, Defendants).

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[48]   Mintert Report, ¶¶70–71.

[49]   *Id.* and SBF0224522.

[50]   SBF0224522 at 523–524.

[51]   *Id.*

[52]   *Id.*

[53]   *Id.*

[54]   *Id.*

(ii)   Defendants' Experts Mischaracterize the Nature of "Independent" Hog Growers

45.   Dr. Haider and Dr. Mintert also mischaracterize the relationship between hog growers and pork processors. Defendants' experts emphasize the "independent" nature of many hog growers, both in terms of hog ownership and decision making. In fact, many hog growers are "independent" in the sense that they are legally separate entities who own and operate their own facilities and (frequently) retain legal ownership of hogs until they reach maturity and are sold to processors. However, Defendants' experts seemingly equate literal or legal ownership with a much broader form of economic independence. Indeed, Dr. Haider and Dr. Mintert describe hog growers' decisions regarding the volume of hogs they raise and market, whom they contract with, and other aspects of the business as if they took place in a vacuum, independent of influence from Defendant pork processors.[55]

46.   While a hog grower may, in theory, be free to raise as many or as few hogs as he desires, it is simply untrue that such decisions are made independent of processors. I am unaware of any materially large market for hogs outside of slaughtering them to make pork products.[56] Accordingly, hog growers would rationally only raise hogs if they believed that there was a high degree of certainty of being able to sell those hogs. While historically, many hogs were sold through spot markets, that is no longer the case—by 2008 around 9% of all hogs marketed in the United States were sold through spot markets.[57] The rest were sold pursuant to

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[55]   Mintert Report, ¶¶49–53; Haider Report, ¶57 ("Hog producers determine the supply of hogs primarily through their decisions as to how many sows to breed."). Defendants' experts use a similar line of reasoning to inappropriately characterize the nature of Triumph's hog supplies. For example, Dr. Mintert includes a chart showing that 100% of Triumph's hogs are "Not Company-Owned" and writes that as "the Exhibit shows, several Defendants, including Triumph . . . do not own the majority of the hogs they slaughter." But Dr. Mintert then discloses in a footnote that this conclusion is really just exploiting a technical definition related to Triumph's ownership structure. Indeed, Dr. Mintert ultimately concedes that "Triumph received 72% of its hogs" from its members. Mintert Report, ¶55 (and footnote 130); Mintert Exhibit 4; *see also* Mintert Deposition, p. 132:4–16 (recognizing that the member owners of Triumph "would definitely have a financial interest in Triumph."). This type of emphasis on purely legal distinctions is not economically sound and does not reflect the realities of the market.

[56]   *See* Mintert Deposition, p.143:6–8 ("Q. Are you aware of any other primary markets for hogs other than pork processing? A. No.").

[57]   According to Trist and Wise (2010), p.10, over 90% of hogs were sold via contracts by 2009. According to Meyer and Goodwin (p. 17), the share of hogs sold in spot markets has "declined steadily" and reached an "all-time low" in 2020; National Hog Farmer, "Spot Marketing Hog Sales Slip in January," Mar. 11, 2008, *available at* https://www.nationalhogfarmer.com/marketing/news/0311-marketing-hog-sales-slip.

contracts—almost all of which were with Defendants.[58] While in theory any hog grower may be able to "independently" decide to raise 100 or 1,000,000 hogs, it makes no economic sense to propose that the grower would make that decision without taking processors' demand (or expected demand) fully into account. And because Defendants have no use for hogs outside of making pork products, their demand for hogs is tied to the downstream demand for pork. It would be economically nonsensical for Defendants to contract for a number of hogs that exceed expected pork demand, and it would be similarly economically nonsensical for growers to "independently" elect to raise more hogs than processors demand. As I set forth in my original report and Dr. Mintert confirms in his, the vast majority of hog production is done directly by Defendants or under contract, and the prevalence of spot market purchases of hogs has steadily decreased since the start of the Conspiracy Period, to the point of which it is now virtually non-existent.[59] In this way, hog growers are essentially contract manufacturers for Defendants, and they rely almost entirely on those contracts to inform their "independent" decisions about how many hogs to raise.

47.   As mentioned above, and in the Mangum Report, hog contracts impose significant restrictions on growers.[60] For example, a hog procurement agreement between Hormel and Partners In Pork, LLC requires the grower to allow Hormel to "review and approve" numerous aspects of the grower's facilities and operations.[61] Hormel was thus granted oversight or approval authority on the hogs genetics, farrowing and weaning facilities, and the feed used to grow the hogs.[62] With respect to feed, the producer was required to "follow Hormel Foods' written recommendation on feeding of dried distiller's grains with solubles ("DDGS")," and granted Hormel the authority to "in its sole discretion change the DDGS policy."[63] The same contract gave Hormel oversight and approval authority over the grower's accounting system, its tracking and labeling system, and veterinary care, and also imposed restrictions on the

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[58]   As reported in the Mangum Report, Defendants collectively held over 80% of the packing market. See Mangum Report, ¶¶101–104.

[59]   *See* Mangum Report, ¶¶56–57; Mintert Report, Exhibit 2 (Graph showing hogs sold by purchase type from 2007 through December 2021).

[60]   Mangum Report, ¶111.

[61]   HFC-PORKAT0000046909–937.

[62]   *Id*.

[63]   *Id*.

attributes of delivered hogs (*e.g.*, "Top quality, healthy and wholesome hogs that pass pre and post mortem inspect," minimum and maximum carcass weights, adherence to animal care and handling guidelines).[64] The contract further imposes restrictions on how the hogs may be delivered to Hormel—including which transporters are authorized, and requiring scheduling notice and coordination before deliveries, while also granting "specific delivery days and times to be determined by" Hormel.[65] Additional restrictions include Hormel's rights to investigate the "financial soundness" of the grower by reviewing financial statements, to "inspect" the grower's "hogs and facilities" with reasonable notice, and to comply with a comprehensive "quality assurance program and animal care & Handling Program," including maintain various certifications from third party organizations.[66]

48.   The hog contract described above is not unique; contracts between other growers and processors include similar restrictions. For example, a contract between Hormel and MGM, LLC contains largely similar obligations while adding requirements related to insurance and a limitation on production costs ("Producer's production costs shall not differ materially from similar costs typically incurred by large producers producing hogs of a high quality, unless consented to in advance writing by Hormel Foods.").[67] Contracts between Seaboard and hog growers show similar restrictions,[68] as do contracts growers entered into with other Defendant processors.[69]

49.   As shown in these agreements, saying a hog grower is "independent" does not mean that it operates "independently" in the sense that it acts without consideration of processors' desires

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[64] *Id.*

[65] *Id.*

[66] *Id.*

[67] HFC-PORKAT0000047424–457. *See also* HFC-PORKAT0000047101–137; HFC-PORKAT0000047054–7071.

[68] SBF0667969–8004; PFI00001270–308 (compliance with processor's animal handling, nutrition, and genetics requirements, among numerous other obligations); PFI00005570–631; PFI00005632–655.

[69] *See, e.g.,* TF-P-000494885–894; TF-P-001605595–605; TF-P-002253012–3023; TF-P-000800928–950; SBF0617731–749; SBF0258716; SMITHFIELD04391680–687; SMITHFIELD04092493; SMITHFIELD04126297; JBS-PORK-00220320–324; JBS-PORK-00309581–613; JBS-PORK-01093548–578; JBS-PORK-00220947–981; CLMNS-0000643212–227; CLMNS-0000704908–921; TRI0000387004 (contract draft between Triumph and Maschhoffs, showing that Maschhoffs had to comply with specific animal handling practices, use approved genetics, and meet nutritional requirements); Triumph also required rights with respect to the use of ractopamine, iodine levels, and other nutrition standards (TRI0000262043; TRI0000262075).

or actions. Rather, Defendant processors are granted considerable oversight and decision-making authority throughout the contractual term in numerous aspects of the grower's operations. This form of detailed contracting allows Defendants to approximate being vertically integrated, even for hogs that they do not technically own.[70]

50.   Dr. Haider claims that pork processors "do not control the supply of the independent hog producers that they contract with," and adding that marketing contracts are "typically non-exclusive."[71] Dr. Haider cites to the USDA's Swine Contract Library to support her claim, explaining that "[w]hile contracts may grant the buyer the right of first refusal for excess hogs produced by the seller, the contract terms do not typically appear to limit the seller from selling to other packers in the event the buyer refuses to purchase any such excess hogs."[72] As an initial point, the "library" is not a comprehensive collection of contracts, but rather a "catalog of the types of contracts offered by packers to swine producers."[73] Due to strict confidentiality provisions under the Livestock Mandatory Reporting Act, the library does not contain "either the example contracts or other proprietary information."[74] Instead, the library contains various terms pulled from anonymized contracts with limited information regarding the actual frequency or utilization of those terms in the market place.[75]

51.   Further, simply because hog producers are able to sell excess hogs to other packers only after their contracted packer has relinquished its right to buy does not mitigate the packers' influence over the supply of hogs. As I explained above, only a small portion of hogs are sold on the

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[70] Dennis Carlton and Jeffrey Perloff, *Modern Industrial Organization,* 4th ed. (Chicago, IL: Addison Wesley, 2005), p. 395.

[71] Haider Report, ¶67.

[72] Haider Report, footnote 84.

[73] USDA, "Swine Contract Library Information," accessed Nov. 10, 2022, https://www.ams.usda.gov/rules-regulations/packers-and-stockyards-act/regulated-entities/swine-contract-library.

[74] See USDA, "FAQ's - The Swine Contract Library," accessed Nov. 10, 2022, https://www.ams.usda.gov/rules-regulations/packers-and-stockyards-act/regulated-entities/swine-contract-library-faq.

[75] "Producers may use the library to investigate what contract terms packers offer. . . . [Producers] would [not] know how a packer would combine those provisions in any contract. However, it is valuable to know that those provisions exist in the marketplace." See USDA, "FAQ's - The Swine Contract Library," accessed Nov. 10, 2022, https://www.ams.usda.gov/rules-regulations/packers-and-stockyards-act/regulated-entities/swine-contract-library-faq.

spot market and producers make a smaller return on these hogs since they are sold at a lower price.[76]

c. *Defendants' Experts Understate the Role Packers Play in Determining Hog Supplies*

52. Dr. Mintert states that "Defendants collectively do not produce the majority of the hogs they slaughter."[77] However, I have not opined that Defendants produced the majority of the hogs they slaughter. Indeed, I showed in the Mangum Report that each Defendant has a different degree of vertical integration and that some Defendants (*e.g.*, Tyson and Hormel) produce only a very small share of their slaughtered hogs internally.[78] As discussed above, Dr. Mintert is incorrect in his conclusion that a lack of pure vertical integration eliminates a packer's power or influence in the hog market. Vertical integration is not required to possess market power.

53. Additionally, Dr. Mintert attempts to downplay Defendants' role and importance in the hog market. For example, he cites testimony from Steven Meyer who stated that "producers decide what the supply of pigs is going to do – be by their decision to breed sows […] packers don't decide how many pigs are slaughtered. They slaughter the available supply in any given time period."[79] He similarly states that "the decisions of independent producers are spread across thousands of different entities of varying sizes and business models."[80]

54. While these passages have a grain of technical truth, they strip away all of the context and economic realities that undermine the conclusions Dr. Mintert tries to derive from them. For example, while growers technically determine how many sows to raise and breed, those same sow and breeding decisions are made almost exclusively to meet the hog volumes they are contractually obligated to produce for Defendant packers. In other words, Dr. Mintert's

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[76] See paragraph 46 above. The "negotiated" (spot market) price is the lowest of all the hog sale options, including "swine/pork market formula (a contract where the price is determined by a publicly reported hog or pork price, *e.g.* Iowa-Minnesota top or carcass cutout value), other market formula (a contract based on the lean hog futures contracts), other purchase agreements (all other producer marketing contracts), [and] packer sold (from one packer to another)." Swine, "Marketing Slaughter Hogs Under Contract," Aug. 29, 2019, https://swine.extension.org/marketing-slaughter-hogs-under-contract/, Table 2.

[77] Mintert Report, ¶54.

[78] Mangum Report, ¶¶110–117.

[79] Mintert Report, ¶50 (citing Deposition of Steve Meyer, Apr. 26, 2022, p. 378:7–25).

[80] Mintert Report, ¶52.

comment about "autonomous decisions" ignores that those same growing decisions are informed by the contracts packers offer them and the capacity of packers to process hogs. Not only is it economically absurd to think that hog growers make sow and farrowing decisions in the dark, but it is also empirically incorrect. As nearly all hogs are sold via contracts, growers do not make "independent" decisions about how many hogs to raise, but base those decisions on meeting their contractual obligations and the demand by Defendants who control the pork packing industry. Dr. Mintert's argument that growers can raise any number of hogs they want, and processors will automatically purchase and slaughter them, is out of harmony with the basic concept of market equilibrium. If suppliers bring more hogs to the market than processors demand, that is referred to as a surplus.[81] Market forces will deal with such a surplus, even in the short run, by reducing the prices paid to growers.[82] Because growers (like all sellers) prefer higher prices, they will—other things equal—seek to match their output with processors' demand.

55.   Dr. Mintert's comments about "thousands" of independent growers misses the forest for the trees. In fact, virtually all of these growers make their hog growing decisions based on their need to meet contractual obligations with Defendants.[83] Additionally, Dr. Steven Meyer himself testified that growers are aware of packers' slaughter capacity.[84] Dr. Mintert's portrayal of a vast and diverse array of growers who make independent decisions on when and how to market their hogs is inconsistent with the evidence that nearly all hogs are sold pursuant to contracts.

56.   Finally, Dr. Meyer's testimony about producers deciding how many hogs are slaughtered is also misleading. I have already discussed evidence showing that hog contracts often dictate

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[81]   Robert S. Pindyck and Daniel L. Rubinfeld, *Microeconomics,* 9th (Global) ed. (Essex, England: Pearson Education Limited, 2018), p. 47. Steve Meyer commented on this situation in 2018 when he expressed concerns about delays in opening a new shift at STF and "some delays" with the opening of Prestage's new facility. According to Meyer, such delays in capacity expansion create an imbalance between processor demand and grower supply that "puts more hogs on the market." J. Deyoung, "Pork packing capacity faces delays to growth," *Iowa Farmer Today,* June 15, 2018, https://www.agupdate.com/iowafarmertoday/news/livestock/pork-packing-capacity-faces-delays-to-growth/article_f86fde7e-64dc-11e8-b288-475ac8083072.html.

[82]   *Id*.

[83]   This follows from the fact that a) nearly all hogs are sold to Defendants, and b) nearly all hogs are sold pursuant to contracts.

[84]   Deposition of Steven Meyer, Apr. 26, 2022, pp. 274:17–275:7.

deliveries of hog volumes that are negotiated with packers. However, Dr. Meyer's testimony is only relevant for within-contract hog volumes, and therefore it misses the larger point that Defendants can influence the long-term supply of hogs by altering their own demand. It is economically irrational for hog growers to raise materially more hogs than they have contracts for. Accordingly, if Defendants—who collectively represent nearly the entire demand curve for hogs—decrease their joint demand for hogs by contracting for relatively fewer hogs, growers would rationally respond to raising relatively fewer hogs. While this may not affect hog deliveries in "a given time period," over a longer period of time (such as the Conspiracy Period), Defendants clearly can significantly influence the supply of hogs.

57.   Closely related to his misleading use of Dr. Meyer's testimony, Dr. Mintert also cites an article written by Ron Plain for "National Hog Farmer" for a quote stating that "Packing is a service industry. Packers don't control weekly hog slaughter; producers do by how many hogs they collectively market."[85] However, packing is clearly not just a "service industry."[86] Packers are not merely resellers or distributors who add a fixed margin to goods produced by other manufacturers.[87] As discussed throughout this report, as well as the Mangum Report, Defendant packers were engaged, either directly through vertical integration, or through extensive contracting (which gave them significant influence), in virtually every aspect of hog raising and pork production. Further, Mr. Plain's description of who "controls" the weekly hog slaughter misses the point. As discussed above, Defendant packers use contracts and their own hog holdings to significantly influence the volume of hogs that come to market.

d. Defendants' Experts Ignore Processors' Buyer Power

58.   Defendants' experts overstate the choices hog growers have and ignores both documentary evidence and academic research supporting the conclusion that Defendants hold buying power

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[85]   Mintert Report, ¶80.

[86]   *See, e.g.,* TF-P-001635110 (email from Schwartz Farms to Tyson complaining about packers limiting slaughter (to the detriment of growers) at various times in order to improve their margins); TF-P-001563315 (discussion about the need to communicate plans to cut slaughter rates and the need to "stop the continued rise in the hog market."); and TF-P002388035 (emphasizing that the NPPC "does NOT speak for the Pork industry but for the Pork Producers only . . . it is all about who owns the meat and WE, the owners of the meat, have to have control over the market access for meat.").

[87]   In any event, even firms acting in the economy as resellers cannot be forced to buy excess product just because a manufacturer brought the excess product into existence.

in the hog market. For example, despite multiple references to it in the Mangum Report, Dr. Haider does not in any way address the literature related to packers' buyer power in her report. For example, in their 2010 paper, Trist and Wise articulated several ways in which packers have buyer (or "monopsony or oligopsony") power over growers. Such reasons include (but are not limited to): a) the fact that growers are selling perishable goods, often with large storage costs and limited shipping options; b) "captive supply" situations in which "a packer also owns large volumes of livestock or controls livestock through contracting;" and c) packer-controlled production, which serves to reduce the "share of animals traded on the open market," which limits price discovery and allows packers to potentially manipulate prices.[88]

59.   Hog growers' "ability" to negotiate and contract with any processor really just means they have the freedom to choose between different Defendants, because Defendants control 80%–90% of the pork market, a fact which Dr. Haider and Dr. Mintert have not challenged.[89] Accordingly, growers typically have (at most) a "choice" between individual Defendants, all of whom are alleged to have been part of a conspiracy.[90]

e.   Dr. Mintert's Claim that Defendants Benefited from Higher Hog Supplies is Unsubstantiated and False

60.   Dr. Mintert argues that Defendants benefit from long-term, plentiful supplies of hogs, and that lower hog supplies do not translate to higher profitability[91] Numerous statements and documents produced by Defendants in this case contradict Dr. Mintert. For example, a Hormel document related to Pork Raw Material Prices (*i.e.*, hogs) states that "Margins have been extremely tight for U.S. pork producers for much of the past year even with lower corn prices.

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[88]   Trist and Wise (2010), pp. 7–9.

[89]   See Mintert Deposition, pp. 60:12–62:17.

[90]   Growers who do not have farming facilities in sufficiently close proximity to multiple Defendants would obviously have even more limited options. According to Jere Null (CEO of Prestage Foods of Iowa in 2019), one reason that Prestage spent hundreds of millions of dollars to open a packing facility in mid-2018 was that there "was an imbalance of packer capacity versus producer capacity that was not being addressed, which led to depressed pricing for Prestage's livestock as well as those raised by others in the Midwest." Null also stated that the "U.S. packing industry has consolidated in the last 25 years, leaving fewer choices for producers to market their animals to, and leaving fewer choices for retailers and distributors to purchase from." Sharon Spielman, "How Prestage Foods of Iowa Built a State-of-the-Art Pork Processing Plant," *Food Engineering*, Dec. 9, 2019, https://www.foodengineeringmag.com/articles/98612-prestage-farms-built-a-state-of-the-art-pork-processing-plant-in-northwest-iowa.

[91]   Mintert Report, Section III.D.

This provides the incentive to decrease supply in an effort to raise prices."[92] Similarly, communications between Cory Bollum (of Hormel) and Jim Long (CEO of Genesus) state that the "only best hope, pork supply drops to a level that hog prices rocket higher and feed prices become next to irrelevant. We have been aggressive since the first part of July that U.S. hog prices will be the highest in history the summer of 2013. . . . We believe the North American breeding herd is getting smaller each and every day."[93] Jim Lechner (Tyson) explained during an earnings call that liquidation of hog supplies will lead to pork production decreases that would "improve producer profitability."[94] As Seaboard's former CEO Terry Holton testified, it would be inaccurate to state that Seaboard was always interested in having more hogs available on the market.[95]

61.   Dr. Mintert attempts to show that higher hog production (or slaughter) is associated with higher packer profitability (or margins).[96] However, Dr. Mintert makes a fundamental econometric mistake and equates correlation with causation. Simply because hog supply is positively correlated with hog margins, does not mean that increases in hog supply cause higher margins. Dr. Mintert entirely ignores the concept of pork *demand* in his "quantitative" analysis. One would expect that an increase in demand would have a positive impact on prices and the supply of pork (*i.e.*, when demand increases, prices and supply would also increase in response). Dr. Mintert incorrectly attributes his observed higher profitability during periods of higher hog production to that increased supply, rather than to underlying increases in demand. That *margins* increase along with demand and supply (see Dr. Mintert's Exhibit 7 Panel A) simply illustrates pork packers' buyer power: they are able to capture more of the increase in price than the hog producers.

62.   Dr Mintert illustrates this concept precisely in his Exhibit 7 Panel B, showing that higher slaughter volumes are correlated with a lower share of the wholesale pork value for hog producers. Dr. Mintert explains that "if one believed that the relationship from Panel A of

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[92]   HFC-PORKAT0000131245.

[93]   HFC-PORKAT0000045153.

[94]   TF-P-000014545.

[95]   Deposition of Terry Holton, Sept. 8, 2022, pp. 63:11–64:6.

[96]   Mintert Report, ¶¶87–92.

Exhibit 7 [showing positive correlation between wholesale margins and the number of hogs slaughtered] was simply driven by generally favorable market conditions, such as higher consumer demand for pork, then one would expect that the producers' share would be flat, or even slightly increasing, in slaughter volumes. A 'rising tide' argument suggests that nominal price spreads increase only because factors such as higher demand drive up profitability for both processors and producers, leading to higher hog supplies and nominal price spreads." However, Dr. Mintert provides no support for his claim that the producers' share of the downstream value should remain steady, or even increase, when demand increases. In fact, the assertion that favorable downstream market conditions, such as higher consumer demand for pork, would impact the pork packers (who manufacturer and sell the pork product) and the upstream hog producers in an identical manner is unsubstantiated and demonstrably false, especially in the case, as it is here, where the downstream manufacturers and sellers (*i.e.* the pork packers) control their entire level of the supply chain. An increase in consumer pork demand would lead to higher prices that pork packers can charge, but since the pork packers dominate the pork packing market and hog producers have no other channels through which they can sell hogs, it is no surprise that pork packers can wield their buying power and suppress the marginal increase in price they pay for hogs. That pork packers can capture a higher share of the increased pork wholesale value is entirely consistent with Defendants dominating the pork packing market and capitalizing on their buying power in the hog market.

B. Defendants' Experts Fail to Address the Evidence Related to Exports in The Mangum Report

63.   In the Mangum Report, I explained that Defendants repeatedly and increasingly utilized export markets throughout the Conspiracy Period.[97] I also discussed documents in which Defendants explicitly acknowledged that the export market was being used strategically to decrease domestic supply and increase domestic prices.[98] Finally, I discussed how, according to Defendants themselves, even a relatively small reduction in the amount of pork available domestically can have a large impact on the price paid by domestic customers.

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[97]   Mangum Report, Sections II.F.3. and III.B.1.

[98]   *Id*.

64.   In her report, in which she criticizes my analysis of Defendants' exports of pork products.[99]
        Dr. Haider complains that I have not established the "but-for" level of exports and asserts that
        the behavior of individual pork processors (including non-Defendants) is inconsistent with my
        opinions.[100] As an initial matter, Dr. Haider made no attempt to estimate the but-for levels of
        exports. Moreover, the alleged conspiracy pertains to the prices of pork sold domestically.
        Estimating the but-for level of exports is unnecessary, because it does not address the key
        question at issue: Were domestic pork prices higher as a result of the alleged collusion? To
        address that question, my econometric models provide clear evidence that domestic pork prices
        were elevated above but-for levels. Record evidence, as discussed below, indicates that the
        Defendants had the ability to use exports, among other things, to affect domestic prices.
        Dr. Haider's demand that I also establish but-for export levels is just an attempt to move the
        goalposts.

1. Dr. Haider Ignores Defendants' Own Statements About the Role of Exports

65.   In the Mangum Report, I cited evidence in which Defendants explicitly acknowledged the
        value of increasing exports—even at a loss, if necessary—in order to increase domestic
        prices.[101] For example, in late 2015, when asked why Smithfield was willing to "export at a
        loss," Dhamu Thamodaran of Smithfield emphasized the same point he had made several years
        before: "If it helps the integrated system then we need to do it. . . . Very simple: More exports
        translate to higher meat value."[102] Numerous other documents referenced in the Mangum
        Report show similar comments about the importance of exporting pork in order to increase
        prices domestically and thereby earn higher profits.[103] Neither Dr. Haider nor Dr. Mintert even
        mentions, much less rebuts, any of this evidence.

2. Dr. Haider Does Not Challenge My Analysis of Export and Domestic Pricing

66.   In the Mangum Report, I presented an analysis of prices for pork products sold in export
        markets compared to those sold domestically. The purpose of this analysis was to consider the

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[99]   Haider Report, Section V.D.

[100] Haider Report, Section V.D.1.

[101] Mangum Report, ¶¶173–179.

[102] SMITHFIELD00872455.

[103] Mangum Report, ¶¶173–179.

possibility that exports were increasing simply because Defendants were receiving higher prices in export markets. As shown in the figure below (which is unchanged from the Mangum Report), evidence suggests that prices for exports were in fact *lower* than domestic pork prices. While the domestic and export prices were nearly equivalent in the years prior to the Conspiracy Period, starting in 2009 a consistent gap emerges between them, with domestic prices consistently outpacing export prices. The fact that the price per kilogram does not rise even after 2015, when exports most dramatically increase, is an indication that the true value of exports is not in their inherent profitability, but in the related effect they have on domestic pork prices.

Figure 1. U.S. ITC – Pork Exports & Values[104]

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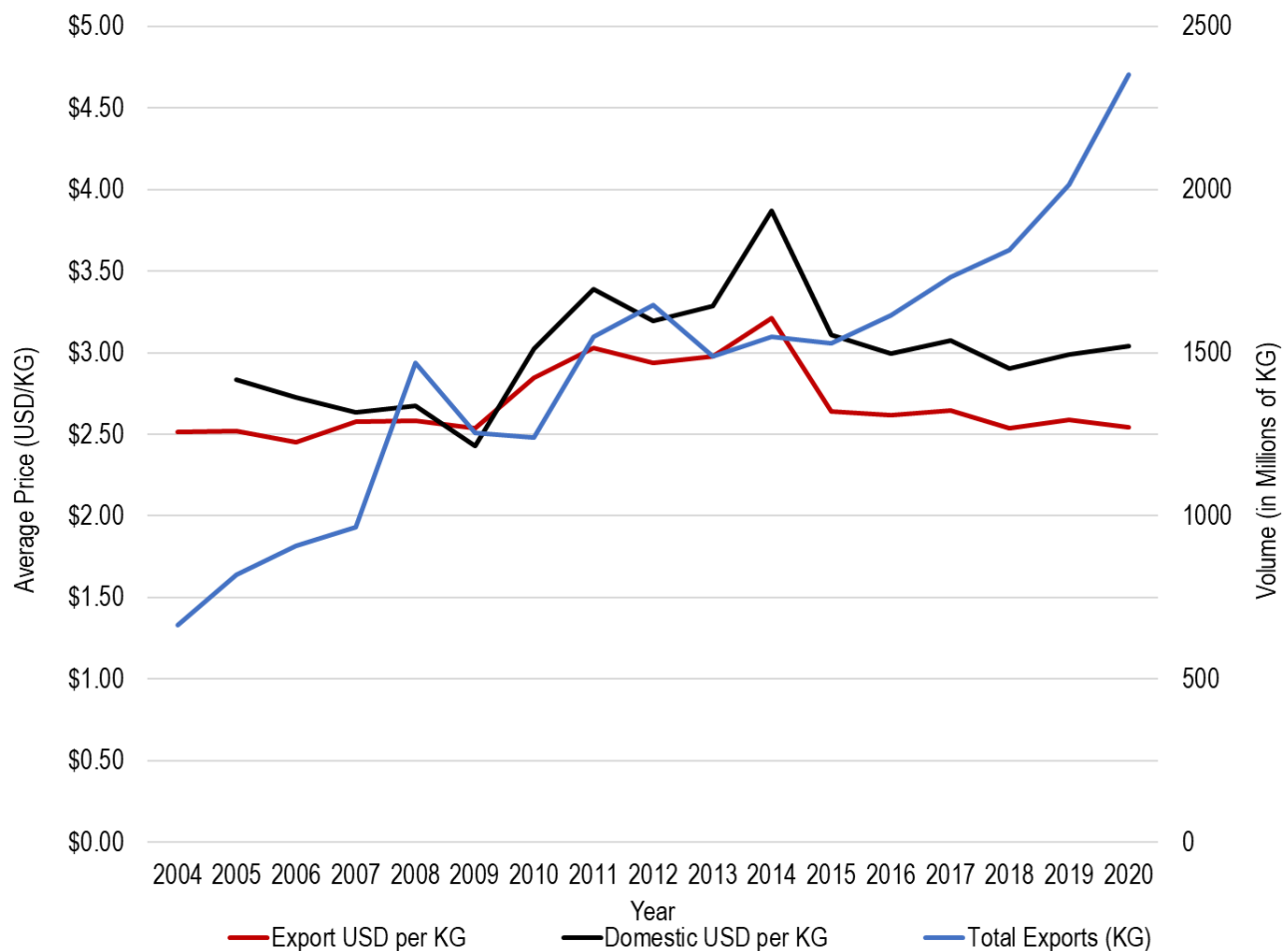
[104] USITC DataWeb, *available at* https://dataweb.usitc.gov/trade/search/TotExp/SITC. See Mangum Report, Figure 26.

67.   As I explained in the Mangum Report, this is evidence that increasing exports was valuable to not simply because the exports themselves were highly profitable, but because it increased profits on domestic sales.[105] Dr. Mintert neither mentions nor rebuts this evidence. Dr. Haider briefly mentions this analysis in a footnote, but only to say that the data I relied on includes non-class pork products.[106] However, the inclusion of non-class pork products does not overturn the conclusion that Defendants used exports as a means to increase domestic pork prices by restraining domestic supply. More importantly, Dr. Haider does not address the evidence of Defendants specifically discussing increases in exports of class products.[107] Further, Dr. Haider ignores my analysis showing that, net of exports, the domestic pork supply remained below its pre-Conspiracy levels until 2018.[108] My analysis of the USITC data is consistent with this evidence.

3. Defendants' Experts' Claims about Factors Affecting Exports do not Contradict My Opinions or Analysis of Defendants' Export Activities

68.   Dr. Mintert writes about "factors shaping demand for U.S. pork exports during the alleged Conspiracy Period," and discusses several topics that affect long-term supply and demand conditions, such as exchange rates, swine disease, and trade regulations.[109] From that, Dr. Mintert concludes that I "[failed] to consider these important drivers of export demand" and that this is a "critical flaw" in my analysis and opinions.[110] It is unclear which of my analyses and opinions Dr. Mintert is referring to, or how any of his own analyses and opinions rebut or refute anything I said.

69.   Specifically, Dr. Mintert opines that "international demand for U.S. pork grew" prior to and during the Conspiracy Period, and that this was due to a number of different factors.[111] Indeed, I also pointed out that pork exports were rising before and during the Conspiracy Period, and that this flowed from multiple factors, including rising incomes abroad and the comparative

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[105] Mangum Report, ¶¶172–179.

[106] Haider Report, footnote 173.

[107] Mangum Report, ¶¶173–179

[108] Mangum Report, ¶83 and Figure 16.

[109] Mintert Report, ¶¶152–161.

[110] Mintert Report, ¶161.

[111] Mintert Report, ¶152.

advantage in production in the United States.[112] I also pointed out that Defendants' own statements indicate that increasing domestic prices was a key objective of increasing exports.[113] Dr. Mintert, however, is entirely silent on this record evidence.

70.   The factors Dr. Mintert references may be of interest regarding the specific volumes of exports attributable to different market factors, yet none of Dr. Mintert's concerns about disease, exchange rate movement, changes in global growth, or changes in trade regulation are inconsistent with the idea that Defendants utilized export markets to help increase domestic prices. Moreover, they do not undermine my opinions in this case: Defendants have the ability to influence domestic supply (and prices) through exports; Defendants collectively increased exports during the Conspiracy Period; export prices were lower than domestic prices; and Defendants explicitly prioritized exports in order to increase domestic prices.

71.   Dr. Mintert also makes arguments about the value of exports by pointing out that, for example, a) the U.S. government encourages exports, b) the use of export markets can increase hog values, and c) that Defendants' investments in exports have been profitable.[114] Again, none of these are relevant to, much less rebuttals or contradictions to, my opinions or analyses in this case. For example, the fact that Prestage and Tyson have devoted resources to producing pork products destined for export markets does not undermine or contradict the fundamental point that Defendants are able to decrease domestic supply by increasing exports. Dr. Mintert's conclusion that these facts are "not consistent with the allegations that Defendants increased export levels to siphon supply away from domestic consumers" is predicated on the false assumption that the driver for pork exports is only either entirely conspiratorial or entirely non conspiratorial. Indeed, increasing sales to new markets in response to growing demand in new markets does not require increases in prices to existing markets—both markets can be served through increased production.[115] Thus, Defendants' experts' statements regarding potential factors influencing exports do not logically connect with higher prices domestically. In fact, Defendants' own statements—that increased exports increased domestic prices—demonstrate

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[112] Mangum Report, ¶72.

[113] Mangum Report, ¶¶173–179.

[114] Mintert Report, ¶¶146–151.

[115] That is, growth in foreign markets can be met through incremental production increases, not just through diversion of existing production.

the relevance to the allegations in this case. As I showed in the Mangum Report, even before the alleged conspiracy began, pork exports accounted for a substantial and growing portion of domestic production; therefore, it stands to reason that, but for the alleged conspiracy, Defendants would have continued to utilize and grow pork exports. However, this is consistent with my findings that a) Defendants were able to use exports as a mechanism to restrain domestic supply; b) Defendants themselves highlighted exports as a means for increasing domestic prices; and c) a comparison of domestic and export prices over time suggests that increases in exports were not justified by price.

72.   Dr. Haider similarly argues that I did not sufficiently account for certain factors that she asserts impact export markets.[116] As with Dr. Mintert, Dr. Haider specifically mentions changes in global demand, trade agreements, and disease outbreaks.[117] Dr. Haider incorrectly argues that my analysis ignores such factors and "attributes any change in exports during the 2009–2018 period to Defendants' alleged conduct."[118] This is incorrect—I do not opine that such factors do not affect exports, nor do I opine that they did not cause export volumes to fluctuate during the Conspiracy Period. But Dr. Haider and Dr. Mintert both miss the point: it is possible for exports to rise due both to increases in global demand, and to Defendants' efforts to increase prices domestically. In the Mangum Report, I discussed numerous instances of Defendants making use of export markets specifically to increase domestic prices—not as a response to changes in trade agreements, disease outbreaks, or the other factors Defendants' experts emphasize.[119] Furthermore, the undisputed increases in export demand and production, demonstrate that the overall increases in pork production during the Conspiracy and Class Period did not result in a corresponding increase in domestic pork production.

73.   Dr. Haider also argues that changes in pork exports from some Defendants and non-Defendant suppliers are inconsistent with the allegations in this case, or with my opinions in the Mangum Report.[120] However, outside of her claim that I did not sufficiently address those factors,

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[116] Haider Report, ¶¶95–100.

[117] *Id*.

[118] Haider Report, ¶96.

[119] Mangum Report, ¶¶170–179.

[120] Haider Report, Section V.D.2.

Dr. Haider (like Dr. Mintert) does nothing to demonstrate how or whether any of them would affect my conclusions or analysis, leaving her assertions as conjecture. Further, when she turns to her own regression modeling, Dr. Haider is silent about all of these factors, as she does not suggest, much less incorporate, any new explanatory variables theoretically connected to her conceptual set of factors.

a. Dr. Haider's Analysis of Non-Defendant & Individual Defendant Exports Is Flawed and Irrelevant

74.   Dr. Haider argues that the actions of non-Defendant packers and some Defendant packers are inconsistent with the alleged conspiracy. For example, Dr. Haider presents an analysis of export sales made by non-Defendant packer Sioux-Preme.[121] Dr. Haider estimates that Sioux-Preme's exports increased during the Conspiracy Period, and then suggests that Defendants' increased exports could be explained by "non-conspiratorial" conduct.[122] As an initial point, it's unclear how the behavior of a non-Defendant producer has any implications on the conspiratorial or non-conspiratorial factors impacting exports. Simply because a company is not a named Defendant does not mean that their behavior can be used as a benchmark representing "conspiracy-free" behavior. One reason is that companies, especially small ones, may follow the practices of conspiracy participants without being a part of the conspiracy. For example, if a smaller firm observes that industry leaders are taking a price increase, it may follow suit. Using the smaller firm as a benchmark or point of comparison is therefore illogical, and thus inappropriate in such a scenario.

75.   In any event, Dr. Haider's analysis of Sioux-Preme's pork exports is misleading, and her conclusions are flawed. As I showed in the Mangum Report, Defendants (and alleged co-conspirator Indiana Packers) accounted for between 86% and 88% of the packing market during the Conspiracy Period.[123] In contrast, industry data indicates that Sioux-Preme's share of the packing market was less than 1%.[124] To put the difference in clearer context, Sioux-

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[121] Haider Report, ¶101 and Appendix C-6 and C-7.

[122] Haider Report, ¶101.

[123] Mangum Report, ¶101 and Figure 20.

[124] Rabo_0000363133 and Rabo_0000373809. *See also* Deposition of Paul Peil, Dec. 9, 2021, pp. 84–87; Deposition of James Fiala, Mar. 30, 2022, p. 100:2–4.

Preme's daily capacity in the Spring of 2018 was approximately 4,600 hogs per day; at that time, co-conspirator Indiana Packers, which is smaller than all Defendants, had a daily capacity of 17,300.[125] In other words, Sioux-Preme has nearly four times *less* capacity than the smallest Defendant or co-conspirator in this matter (see tables below). Thus, Sioux-Preme's activities in the marketplace are so small in comparison to Defendants that it is not possible to draw any meaningful conclusions from its pattern of exports or other sales. Even ignoring the size differences, evidence indicates that Sioux-Preme also positions itself differently from Defendants. A written description and history of the company indicates that it has intentionally differentiated itself from mainstream packers by focusing on niche products, "starting with naturally raised (no hormones/no antibiotics) and expanding to organic and breed-specific programs."[126] Its "niche" products are primarily sold into export markets and account for most of the company's sales.[127]

Figure 2. Daily U.S. Slaughter Capacity (head per day)[128]

Company	2009	2014	2018
Smithfield	126,300	119,500	130,300
JBS	85,500	87,800	93,000
Tyson Foods	74,550	76,925	81,300
Seaboard	38,200	40,800	62,400
Hormel	37,000	36,800	29,500
Clemens Food Group	10,600	10,400	23,700
Indiana Packing Co	16,500	17,000	17,300
Sioux-Preme Packing	4,200	4,500	4,600
Other	52,075	57,795	56,035
TOTAL	444,925	451,520	498,135

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[125] Pork Checkoff 2017–2018.

[126] Niche Meat Processing, "Sioux-Preme Packing Company," accessed Nov. 10, 2022, https://www.nichemeatprocessing.org/sioux-preme-packing-company/. This is consistent with deposition testimony from David Delaney (of Kerns & Associates), who explained that Sioux-Preme "does niche harvest programs, such as something different than conventional pork." Deposition of David Delaney, Apr. 20, 2022, pp. 173:1–16, 234:25–235:13, and 345:3–346:18.

[127] *Id*.

[128] Mangum Report, Figure 20. See the estimated daily U.S. slaughter capacity in the Pork Checkoff publications. Pork Checkoff, "Quick Facts: The Pork Industry at a Glance," *available at* https://porkgateway.org/wp-content/uploads/2015/07/quick-facts-book1.pdf; Pork Checkoff, "Pork Stats 2014," Nov. 21, 2014, *available at*

Figure 3. Share of Daily U.S. Slaughter Capacity[129]

Company	2009	2014	2018
Smithfield	28%	26%	26%
JBS	19%	19%	19%
Tyson Foods	17%	17%	16%
Seaboard	9%	9%	13%
Hormel	8%	8%	6%
Clemens Food Group	2%	2%	5%
Indiana Packing Co	4%	4%	3%
Sioux-Preme Packing	1%	1%	1%
Other	12%	13%	11%
TOTAL	100%	100%	100%

76.   Setting aside the size and relevance of Sioux-Preme in the overall pork market, Dr. Haider's analysis of its export shares is inaccurate and misleading, since it does not appear to capture all of its exports to begin with. In other words, Dr. Haider failed to identify a sizable share of export products in the data: there are multiple "bill-to" customers who are located outside of the US but are sometimes associated with "ship-to" information suggesting that Sioux-Preme Packing shipped its order to the US border (mostly, US-Mexico border). Properly identifying exports based on the "ship-to" *or* "bill-to" customer information—to capture the ultimate customer—drastically changes conclusions about Sioux-Preme's export activity. I note that using the bill-to address— in addition to the ship-to address which Dr. Haider relied upon— leads to export volumes and shares that are more consistent with other evidence related to Sioux-Preme. According to Dr. Haider's analysis, Sioux-Preme's exports account for between 2% and 7% of the company's sales.[130] Given the evidence that niche products account for 60% of the company's sales, and that exports are the primary market for niche products, Dr. Haider's analysis seems erroneous (*i.e.*, her numbers appear far too small).[131] By utilizing the bill-to address, in addition to the ship-to information, exports' share of sales rises

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https://texas4-h.tamu.edu/wp-content/uploads/Pork-Facts.pdf; Pork Checkoff, "Estimated Daily U.S. Slaughter Capacity by Plant (head per day)," Sept. 17, 2018.

[129] See Figure 2 above, "Daily U.S. Slaughter Capacity (head per day)".

[130] Turnover for Haider Appendix C-7.

[131] *See* Niche Meat Processing, "Sioux-Preme Packing Company," accessed Nov. 10, 2022, https://www.nichemeatprocessing.org/sioux-preme-packing-company/. *See also* Bryan Salvage, "Made to Order," Meat + Poultry, Dec. 1, 2009, https://www.meatpoultry.com/articles/1498-made-to-order.

considerably and also presents a different pattern over time than what Dr. Haider has attempted to show. Dr. Haider claims that Sioux-Preme's exports of pork products increased "both in volume and relative to their domestic sales over time, including during the alleged conduct period."[132] As shown in Figure 4 below, after correctly identifying exports, Dr. Haider's claim about Sioux-Preme's exports' growth during the Conspiracy Period lacks support—while there were two sharp increases in exports in 2010 and 2014, the overall trend shows export shares remaining around the same levels as just prior to the Conspiracy Period. In particular, exports' share during the Class Period (*i.e.*, the latter half of the Conspiracy Period) was largely the same as they were during 2008–2009.

**Figure 4. Sioux-Preme's Annual Export Sales of Pork Products, 2005–2017
(Corrected Haider App. C-6)**

Notes: Alleged conduct period and proposed class period end in June 2018.
Source: Sioux-Preme sales data.

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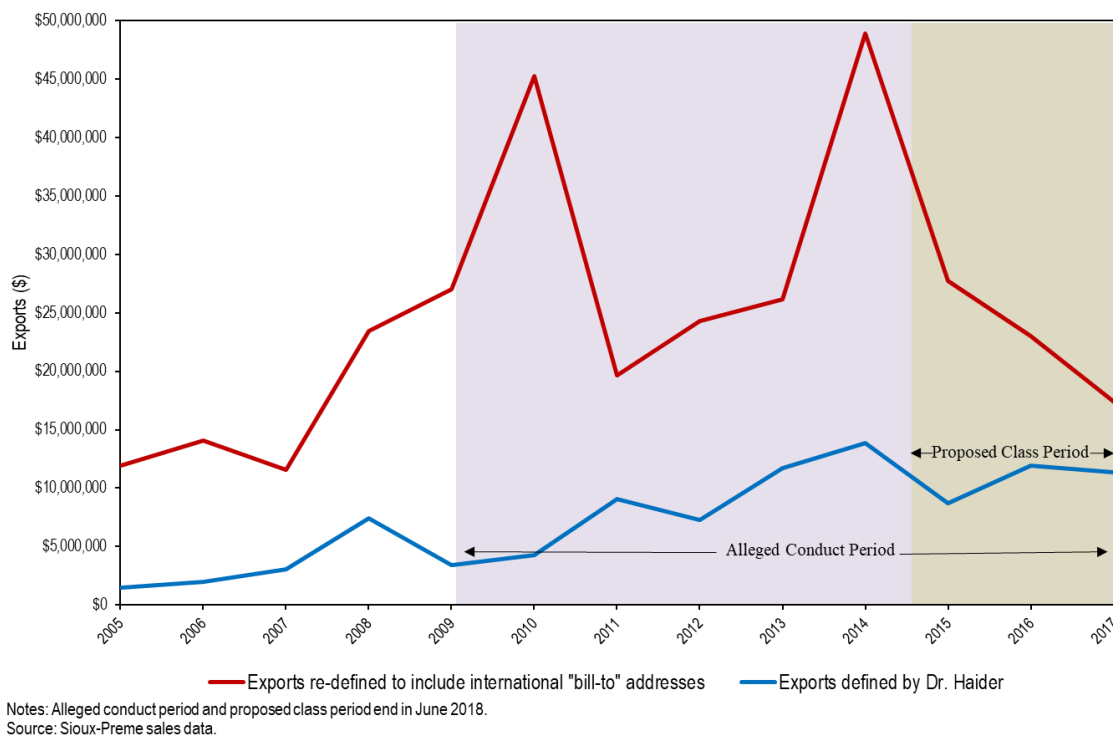
[132] Haider Report, ¶101. The terms "Conduct Period" and "Conspiracy Period" are interchangeable in this report.

**Figure 5. Sioux-Preme's Annual Export Sales Share of Pork Products, 2005–2017
(Corrected Haider App. C-7)**

Notes: Alleged conduct period and proposed class period end in June 2018.
Source: Sioux-Preme sales data.
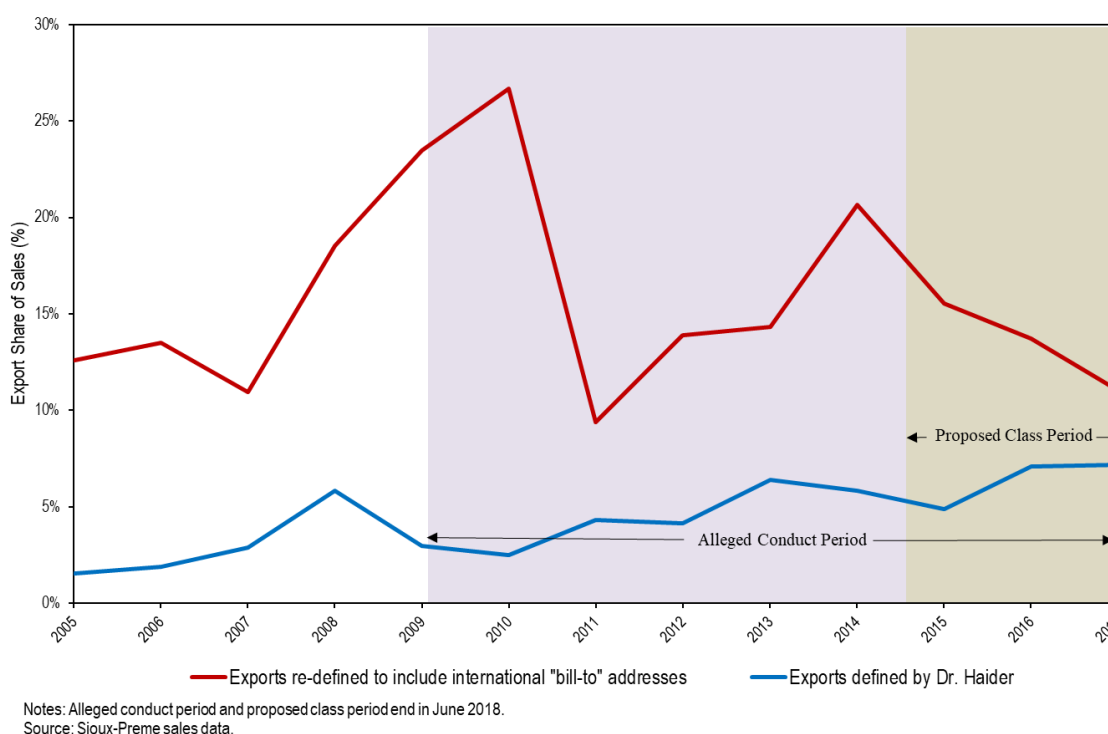
77.   Whether Sioux-Preme's actions are consistent (or inconsistent) with the allegations in this case
       has no bearing on the results of my econometric models, which properly distinguish between
       conspiratorial and non-conspiratorial conduct through a) the benchmark period, and b) an
       appropriate set of variables to control for relevant supply and demand factors. Sioux-Preme is
       not a relevant benchmark, and thus its pattern of sales—exports or domestic—have no bearing
       on any of my analyses or opinions. Just as importantly, they have no bearing on the question
       of common impact. Dr. Haider has failed to explain, address, or even discuss how Sioux-
       Preme's pattern of exports could have an effect on prices that would disparately impact
       meaningful subsets of direct purchasers in the United States.

78.   Dr. Haider follows her analysis of Sioux-Preme's exports with a discussion of Hormel's and
       Tyson's exports, which she claims are inconsistent with the allegations.[133] In particular,
       Dr. Haider argues that these companies' export sales show different "trajectories" for different

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[133] Haider Report, ¶¶102–104.

cuts of pork over time, and that "Class Experts' claim about increased pork exports during the alleged conduct period does not hold across all primal cuts at issue."[134]

79.   As an initial matter, Dr. Haider's criticism is a strawman: I have not opined that exports of "all primal cuts" increased, much less that they increased along the same trajectories. A review of export data from Defendants, or from the USDA, readily shows that certain cuts are exported more frequently than other cuts. Second, a simple review of the charts Dr. Haider uses to make her points about Hormel and Tyson shows that they are not inconsistent with the alleged conspiracy or my opinions in this case. For example, Haider Appendix C-8 shows that Tyson's exports increased substantially early in the Conspiracy Period. Around the time of the PEDv outbreak, Tyson's exports declined (understandably) and then began to increase again by 2016. This pattern is true whether examined in pounds exported or share of total pork products.[135]

80.   The data Dr. Haider relies on for Hormel's exports show the same situation. Following a sharp increase in 2008 (consistent with the large increase in exports due to the Olympics in China), Hormel's exports increased early in the Conspiracy Period before declining around the timing of the PEDv outbreak. Following that episode, Hormel's exports began to steadily rise again in 2015.[136] Thus, both Hormel's and Tyson's data are entirely consistent with what I have already observed and commented on: Defendants were increasing exports throughout the Conspiracy Period. There are exceptional years, but these appear to have readily available explanations that Dr. Haider seems to have ignored.

81.   I also note that Dr. Haider's conclusions regarding Sioux-Preme are inconsistent with her conclusions regarding Tyson and Hormel. If Sioux-Preme's increased exports are evidence that all self-interested or economically rational packers were increasing exports, then it is unclear how she could explain Tyson's and Hormel's exports. Indeed, all Dr. Haider has done is demonstrate that some packers increased exports of some cuts while other packers did not. At the core of Dr. Haider's conclusions is the incorrect assumption that all Defendants—and no non-Defendants—must have acted in identical fashion in furtherance of the alleged conspiracy. The allegations are that Defendants engaged in a conspiracy to increase pork

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[134] Haider Report, ¶102.

[135] See Haider Appendix C-9 and compare with Haider Appendix C-8.

[136] See Haider Appendix C-10 and C-11.

prices; while increasing exports is one method for Defendants to reduce domestic supplies (and therefore increase domestic prices), the alleged conspiracy does not require that each Defendant increase exports by the same amount, or even that they increase exports at all. Dr. Haider's insistence on such a uniform agreement misses the important point: because pork is a commodity-like product, Defendants' products are substitutes for each other, and any increase in exports will raise domestic prices, regardless of which firm (or firms) sold them.

C. My Opinions Do Not Require Establishing But-For Levels of Sow Herds, Hog Production, Or Exports

82.   In the Mangum Report, I discussed Defendants' actions to reduce the domestic supply of pork as part of the alleged conspiracy.[137] In addition to the export analysis described above, I discussed contemporaneous hog market coverage indicating that the sow herd reductions were not explained by normal supply and demand factors. My overcharge analysis further confirms artificially lower levels of domestic pork supply, due to my finding of inflated pork prices. I do not need to calculate but-for levels of sow herds, hog production or exports to determine impact or damages resulting from the alleged conspiracy.[138] Dr. Haider and Dr. Mintert's claims that Defendants' production of pork and their collective slaughter capacity increased over time, and even during the Class Period, do not refute this finding.

1. *Contemporaneous Accounts of the Hog Market Treated Defendants' Actions as Extraordinary*

83.   In the Mangum Report, I discussed Defendants' actions to reduce sow herds and pork production as part of the alleged conspiracy. Defendants' experts argue that these cuts were a normal response to economic conditions in the hog and pork markets at the time and were part of a larger pattern of expansion and contraction.[139] Defendants' experts also argue that Defendants' do not own all hogs, and thus they lack the ability to exert influence in the hog

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[137] Mangum Report, Section III.B.

[138] Dr. Mintert incorrectly claims that my discussion of sow herd reductions fails to account for productivity increases in breeding. Dr. Mintert is correct in that the number of piglets per litter has increased over time, and therefore the number of sows required to farrow a fixed number of piglets has declined. However, for any given litter size, a reduction in sows necessarily leads to a reduction in piglets as well. This reality is the reason Defendants and market participants were calling for reductions in sow herds at the start of the alleged Conspiracy Period: to reduce the number of hogs coming to market.

[139] Mintert Report, Section IV; Haider Report, ¶¶57–58 and 80.

market. As I set forth above, Defendants' experts' claims regarding Defendants inability to influence and restrain hog supplies is unsupported and misplaced.[140] Contemporaneous accounts of Defendants' actions, as well as their own statements, suggests otherwise.

84.   As I discussed in the Mangum Report, industry publication "Pork Powerhouses" saw Defendants' and other large herd owners' actions as extraordinary. Betsy Freese wrote in late 2007 (just prior to the first round of cuts) that "Some things you can just take to the bank. Sow herd expansion among the Pork Powerhouses would fall in that category."[141] Freese went on to explain that the "only constant" in 14 years of her industry tracking is that the 20 biggest sow farms (which include the Defendants) "will add more sows, every year."[142] Writing in late 2009 after the cuts had materialized, Freese again emphasized that this was the "first time since the annual Pork Powerhouses® ranking was launched in 1994, the nation's largest 25 producers have cut sow numbers."[143]

85.   As I also explained in the Mangum Report, Defendants and other industry observers made strong calls for industry "discipline" through production cuts. Larry Pope (of Smithfield) issued warnings that, while Smithfield had made significant cuts, collective action was necessary.[144] He reported speaking with several other "sizeable, more than sizeable large producers" to discuss plans for liquidation.[145] Mark Greenwood (of AgStar) "called on U.S. pork producers" to reduce production, and recommended a reduction of at least 300,000 sows.[146] In other words, Mr. Greenwood appears to put the onus on pork processors (*i.e.*, Defendants) to lead with reductions in current and future hog production (*i.e.*, reduce sow herds). If the production cuts during this period were the inevitable outcome of a normal, recurring trend of supply expansion and contraction, and if—as Defendants' experts insist— hog growers acted independently without influence from processors, it is unclear why industry leaders would need to issue such warnings and calls to action. That is, no industry "discipline"

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[140] *See* Section II. A. 2.

[141] Mangum Report, ¶75.

[142] *Id*.

[143] Mangum Report, ¶76.

[144] Mangum Report, ¶¶76–78.

[145] *Id*. ¶77.

[146] *Id*. ¶78.

is needed when the desired action (lower supply) will already naturally flow from market conditions.

86.   One reason Defendants' statements are noteworthy is that Defendants themselves possess a large share of the hog market, and thus are able to directly influence the volume of hogs, and therefore the amount of pork that gets produced. Further, they are able to signal clearly to other large growers and contract growers, such as Maschhoffs and (at the time) Prestage, about their intentions going forward. In other words, Defendants were telling each other, and their contract growers, what their plans were for hog production. Because of the importance of contracting in the hog market, Defendants' communications about their intentions are a powerful means of influencing future supplies of hogs. "Independent" growers that inexplicably disregard such information regarding a shift in demand from their customers would do so at their own peril.

2. Increases in Defendants' Pork Processing Volumes and Slaughter Capacity Are Consistent with the Alleged Conspiracy

87.   Dr. Haider and Dr. Mintert spend considerable time pointing out that a) Defendants' production of pork increased over time, and even during the Class Period,[147] and b) Defendants collectively increased slaughter capacity over time and during the Class Period.[148] Of course, in the Mangum Report, I presented charts and analyses illustrating these same points.

88.   However, Defendants' experts are incorrect in their conclusion that increased production or capacity are inconsistent with the allegations in this case. I understand that DPPs have alleged a price-fixing conspiracy, which included restraints on the supply of pork. Given that both the population of the United States and demand for pork have grown over time, it is entirely consistent with those allegations that pork output measures also increased over time.

89.   In addition, as I showed in the Mangum Report, despite Defendants' overall increase in pork production, the amount of pork that was actually available domestically for consumers remained below pre-conspiracy levels until 2018.[149] As discussed above, and in the Mangum Report, this is because most of the growth in U.S. pork production was diverted to export

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[147]   Haider Report, ¶81; Mintert Report, Figure 2 and Exhibit 1.

[148]   Haider Report, ¶¶80 and 82; Mintert Report, ¶¶162–168.

[149]   Mangum Report, ¶83 and Figure 16.

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markets.[150] Neither Dr. Haider nor Dr. Mintert responded to this analysis, and their charts and graphs invariably present production growth before accounting for exports. As shown below, once exports are accounted for, Dr. Haider's Exhibit 8 looks significantly different. Because the issue at hand is *domestic* pricing, only pork available to domestic customers matters—and that pork production did not increase until the end of the Class Period.

Figure 6. Annual U.S. Commercial Pork Production, Adjusted for Imports and Exports (Corrected Haider Ex. 8)[151]

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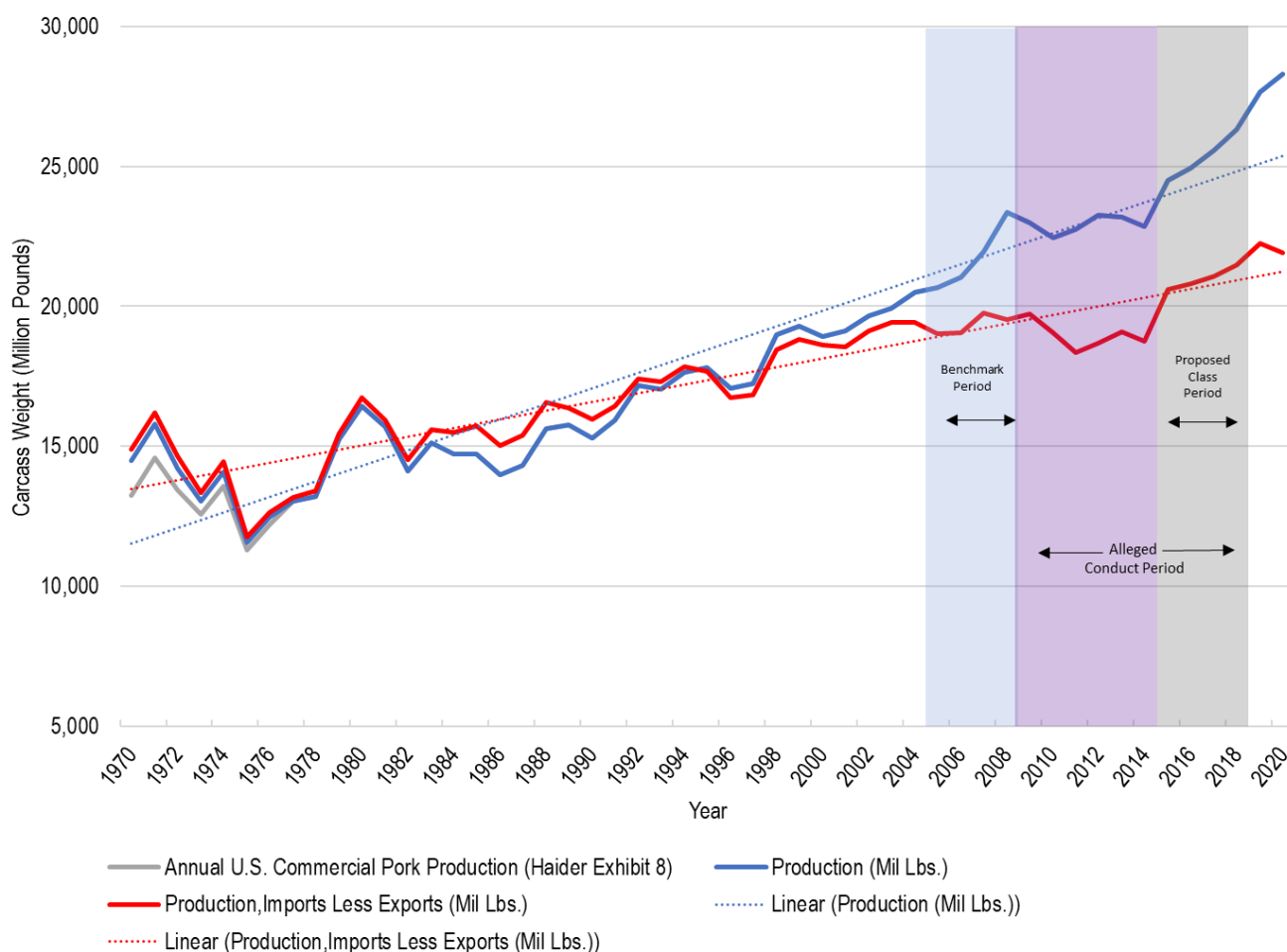
[150] Mangum Report, ¶¶82–83 and 170–179.

[151] USDA, "Livestock and Meat Domestic Data: All supply and disappearance: Historical," *available at* https://ers.usda.gov/data-products/livestock-and-meat-domestic-data/ (*USDA Meat Supply and Disappearance*).

For her Exhibit 8, Dr. Haider relied on "Pork, Slaughter, Commercial – Production, Measured in Lb" series from USDA, NASS. There is a slight discrepancy in the total annual volumes of production throughout the 1970s, after which time both data sources report almost identical commercial production volumes.

90.   In the Mangum Report, I noted that Defendants did not undertake significant increases in processing capacity until very late in the Conspiracy Period.[152] I cited this as evidence of high barriers to entry for the pork market. Defendants' experts do not challenge my opinion with respect to barriers to entry, but both Dr. Haider and Dr. Mintert argue that Defendants and non-Defendants invested in additional capacity during the time period in question.[153] As I discuss below, Defendants' experts' discussions of these capacity increases are misleading and only serve to confirm what I acknowledged myself: Defendants did not meaningfully increase capacity until late in the Conspiracy Period.

91.   In his report, Dr. Mintert presents data showing that pork processors (*i.e.*, Defendants and non-Defendants combined) operated at high levels of utilization throughout the Conspiracy Period.[154] Using surveys of capacity and USDA output, Dr. Mintert estimates that the industry average utilization of approximately 93%, though that figure varies somewhat from year to year.[155] First, I note that the statistics cited by Dr. Mintert are not limited to Defendants—they pertain to the entire pork packing industry in the United States. Despite their dominance, a calculation showing that the industry (as a whole) operated at 93% of capacity does not necessarily mean that Defendants themselves operated at that same level of utilization. Second, even if it is assumed that Defendants were operating at 93% of capacity, according to Defendants' internal elasticity estimates, even modest changes in output can have a significant impact on prices. In other words, the overcharges I estimated are consistent with a relatively modest restraints in output.

92.   Third, Dr. Mintert's comment that processors like Defendants are "subject to factors such as hog supplies" ignores the role that Defendants themselves play in determining hog supplies.[156] As I have explained elsewhere in this report and the Mangum Report, through contracts (both long- and short-term) and buyer power, Defendants have considerable influence over the decisions hog growers make. Hog growers rationally and reasonably act subject to contracts

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[152] Mangum Report, ¶81.

[153] Mintert Report, ¶¶162–169; Haider Report, ¶¶80–82.

[154] Mintert Exhibit 24.

[155] Mintert Report, ¶¶162–163.

[156] Mintert Report, ¶163.

they have with their customers: the Defendants. Any production outside of those contracts is subject to increased risk. If a processor has capacity for 10,000 hogs, and contracts for 9,300 hogs, and the grower raises 9,300 hogs to fulfill the contract, it is incorrect to then claim that the processor was constrained by "factors such as hog supplies"—the processor was constrained by its own decision to contract for less than 10,000 hogs. Fourth, Defendants are not necessarily constrained to the capacity levels reported in the surveys Dr. Mintert relies on. For example, data produced by Smithfield shows that exceeding 100% utilization is possible at times.[157] One way this can happen is if a processor elects to add shifts (either a second shift or a weekend shift) at an existing facility.[158] A Seaboard document from 2012 notes that temporary reductions in hours for a facility can meaningfully affect prices for pork products.[159] Similarly, in 2012, Doug Lorenger and Brad Lorenger of JBS said that they had decided to "cancel this Sat kill and cut" because "margins suck."[160] Brad Lorenger said that cutting back the kill would help "normalize the supply/demand equation."[161]

93.   Finally, while Dr. Mintert shows a number of capacity increases Defendants (and other processors) made, either by opening new facilities or expanding existing facilities his analysis of new plant openings is misleading.[162] In particular, a) of the eight "new" facilities Dr. Mintert identifies, only three are controlled by Defendants, and the one owned by Smithfield is trivial in size (1,000 head),[163] b) each of the Defendants' new facilities opened very late in the alleged

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[157] See SMITHFIELD04771010. Conceptually, "full" or "100%" utilization in this data would be a situation where the actual daily slaughter volume equals the facility's stated daily capacity. This data shows that the number of hogs slaughtered exceeded the stated daily capacity limit in certain months and at certain slaughter facilities.

[158] I refer here to temporary or ad hoc additions. If the addition of a shift is more permanent in nature, such as when STF added a second shift to its new facility late in the Class Period, that may be reflected in a survey of permanent capacity.

[159] SBF0068377 ("This week particularly we are seeing nearly every packer short on hogs and though they have chased the live price up, it is sounding like many are going to reduce hours for the week which could have the most positive impact to prices.").

[160] JBS-PORK-00880535.

[161] *Id*.

[162] Mintert Report, ¶¶164–169.

[163] See Mintert Report, Exhibit 25. For context, Smithfield's total capacity in 2016 was 116,600. Thus, a 1,000 head expansion represents an increase of less than 1% in capacity. See Mangum Report, Figure 21.

Conspiracy Period;[164] and c) Dr. Mintert includes several facilities that opened after the Conspiracy Period.[165]

94. Dr. Mintert's list of existing plant expansions is similarly misleading for the same reasons: a) many of the expansions come from small non-Defendants and account for miniscule increases to industry capacity and b) many of the expansions listed actually took place after the Conspiracy Period.[166] In summary, Dr. Mintert's analysis shows only that very little meaningful expansion took place in the pork industry—particularly among Defendants—until very late in the Conspiracy Period. By ignoring the timing and scope of these expansions and openings, and by including numerous non-Defendants, Dr. Mintert is portraying a false image of expanded capacity by Defendants during the relevant time period.

3. *Analysis of Overcharges Is Clear Evidence of Impact*

95. My damages analysis in the Mangum Report finds positive, statistically significant overcharges across all the different cuts of pork that were included in the class definition. Defendants' experts' claims regarding hog markets, sow herds, and other elements of the industry do not undermine that evidence. As a matter of economics, if prices were elevated above competitive levels, supplies of pork were necessarily lower than they would have been at competitive levels. Further, as discussed in the following sections, there is clear evidence that the impact of elevated prices would be common to all or virtually all direct purchasers.

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[164] See Mintert Report, Exhibit 25.

[165] This includes the facility owned by Prestage Farms, which is also one of the largest new facilities. According to Dr. Mintert's own notes, this facility did not open until 2019. The Premium Iowa Pork facility opened (per Dr. Mintert's notes) in 2020. See Mintert Exhibit 25. Defendants' experts' references to Prestage as evidence of expanded capacity are particularly nonsensical, since Prestage executives clearly explained that their reason for opening a facility in the first place was because Defendants' control of capacity had failed to meet the industry's needs. According to Jere Null (Prestage's then-CEO), Prestage was attempting to give additional choices to producers in an effort to combat 25 years of industry consolidation and an increasing power imbalance in pricing negotiations. Sharon Spielman, "How Prestage Foods of Iowa Built a State-of-the-Art Pork Processing Plant," *Food Engineering*, Dec. 9, 2019, https://www.foodengineeringmag.com/articles/98612-prestage-farms-built-a-state-of-the-art-pork-processing-plant-in-northwest-iowa.

[166] See Mintert Report, Exhibit 26. Dr. Mintert includes expansions from 2019 and 2020 for reasons that are unclear. Further, while the Conspiracy Period extends into 2018, the single largest increase—at STF's facility—did not come online until October 2018. Dr. Mintert was certainly aware of this, as he disclosed it in the footnotes to his Exhibit 26. 11 of the 39 expansions are from small non-Defendant packers, with 2 more from non-Defendant co-conspirator Indiana Packers.

III.   ALL OR NEARLY ALL DIRECT PURCHASERS WERE IMPACTED

96.   In the Mangum Report, I concluded that all or nearly all DPPs were impacted by the alleged conspiracy. [167] This conclusion was based on a) my extensive analysis, including my overcharge regression analyses; b) my finding that the structural characteristics of the market would prevent individual customers from avoiding impact; c) the widespread use of common pricing mechanisms; d) the influence of market prices in the setting of prices for frequently renegotiated cost-plus and fixed price contracts; and e) the high correlation of prices across Defendants, geographic areas, and individual customers. [168]

97.   Dr. Haider criticizes my finding of common impact in three primary ways. First, she argues that my correlation analyses are "not informative of direct purchaser impact." [169] Second, Dr. Haider performs a series of "tests" in an attempt to show that my econometric models do not produce results consistent with a finding that all customers would have been impacted. [170] Finally, she conducts a "price response" analysis, which purports to investigate whether different customers experienced similar changes in prices during the time periods surrounding various industry-wide events. [171]

98.   In the sections below, I demonstrate that each of Dr. Haider's analyses are flawed, misleading and unreliable. In assessing the impact of Defendants' alleged conspiracy, I rely upon the complete analysis I conducted throughout my retention in this case.

A. My Analysis of Correlation Among Prices for Pork Products is Relevant, Appropriate, and Supports a Finding of Common Impact

99.   In the Mangum Report, I showed that Defendants' prices for similar products are highly correlated with each other in general, and that the pricing patterns persist across geographies,

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[167] As I explained in the Mangum Report, the structural characteristics of the pork industry prevented direct customers, including the named plaintiffs, from avoiding price impact due to the alleged conspiracy. See Mangum Report, Section IV. I reached this opinion based on my review and analysis of the pork market structure and characteristics as well as the Defendant sales data for all customers, across in sizes, contracting types and geographic locations.

[168] Mangum Report, Section IV.

[169] Haider Report, ¶156.

[170] Haider Report, Section VI.C–VI.D.

[171] Haider Report, Section VI.F.2.

customers, and product types.[172] Although Dr. Haider criticizes this analysis, she does not appear to dispute the actual finding that the pork prices move together.

100.   Instead, Dr. Haider appears to claim that my correlation "is not informative of direct purchaser impact."[173] Dr. Haider is incorrect. While my direct overcharge models enable me to control for non-conspiratorial factors and isolate the effect of the alleged conspiracy, my correlation analysis examines the relationships between and across customers, regions, and products.[174] Correlation of these prices shows commonality—that pork prices ultimately move together (*i.e.* are positively correlated). Thus, the pricing patterns demonstrate that different customers are similarly affected by supply and demand factors that affect pork prices across different regions and Defendants.

101.   The high correlation of prices across Defendants indicates that individual customers would be unable to avoid impact from the alleged conspiracy by switching to other Defendants.[175] Likewise, the high correlation across geographic locations indicates that the effects of the alleged conspiracy would be nationwide, rather than limited to any particular geography.[176] Finally, the high correlation across individual customers indicates that there is a structure to prices, such that individual customers could not have avoided impact from the alleged conspiracy.[177] This empirical analysis is not intended to isolate the damages resulting from the alleged conspiracy, but to demonstrate that, to the extent damages exist (which I separately determine using my direct overcharge models), they would be widespread and common across the DPP Class.

102.   Dr. Haider notes, "Dr. Mangum himself recognizes that 'correlation analysis is not, *on its own*, conclusive 'proof' of anticompetitive impact,' and yet, he relies on this analysis to conclude that there was impact on 'all or virtually all DPPs.'" [178] The inherent contradiction in Dr. Haider's own words is obvious—I explain thoroughly in the Mangum Report and in this

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[172] Mangum Report, Section IV.D.

[173] Haider Report, ¶158.

[174] Mangum Report, ¶202.

[175] Mangum Report, ¶205.

[176] Mangum Report, ¶209.

[177] Mangum Report, ¶207.

[178] Haider Report, ¶161 (emphasis added).

report that my correlation analysis is but one component of the economic evidence that supports my opinion of common impact and it does not (and does not need to) serve as standalone proof.[179] In addition to my correlation analyses, I also base my finding of common impact on 1) my analysis of the market-based pricing that is typical for DPPs; 2) evidence that bid-buy customers or customers on short-term fixed price contracts would also be impacted; 3) the market structure characteristics that made it difficult for customers to avoid price increases; and 4) additional empirical testing of prices paid by class members.[180]

103.   Dr. Haider's third claim concerning my correlation analyses is that they are based on aggregated price indices and, as such, cannot be relied upon to evaluate pricing patterns across dimensions she believes to be sufficiently granular.[181] In support of that claim, Dr. Haider quotes an article by Dr. Michelle Burtis stating that "the process of aggregating prices across products and consumers (or over time) runs counter to the stated goal of such analysis: to find an underlying pricing structure that links together all prices paid for all products by all putative class members. Aggregating or averaging obscures the very differences in prices that the analysis should attempt to explain."[182]

104.   However, this criticism is not applicable to my correlation analysis. Dr. Burtis is referring to aggregating across meaningful dimensions that obfuscate price variation. She provides an example of four customers—two brokers and two distributors—and explains how averaging prices across customers can show correlation between the customer types (brokers and distributors), even if prices paid by the customers themselves are not correlated.[183] Here, Dr. Burtis is pointing out that aggregating across customers can result in the loss of meaningful information about pricing differences, and can lead to misleading conclusions about correlation (*i.e.* concluding that prices paid by brokers and distributors are correlated even though the individual customer prices are not). However, the index approach I employ for my correlation analyses does not "average" prices in this manner. For my customer correlations,

[179] Mangum Report, ¶¶182–183.

[180] Mangum Report, ¶¶182–183.

[181] Haider Report, ¶¶157–159.

[182] Michelle M. Burtis and Darwin V. Neher, "Correlation and Regression Analysis in Antitrust Class Certification," Antitrust Law Journal 77, no. 2 (2011): 495–532 (hereinafter "Burtis") at 506.

[183] Burtis, p. 507.

for instance, I look at prices by month, product, Defendant, and individual customer, and run separate regressions for each top customer using product and Defendant- specific fixed effects. This means that for each customer, I generate a monthly price index which controls for variations in price based on differences in products and Defendants. I then run my correlations between the individual series for each customer. Dr. Haider's claim that I am averaging prices is entirely misguided and the literature she relies on is not relevant to my actual analysis.

105.   To illustrate the critical difference between the aggregation discussed in the literature on which Dr. Haider relies and the methodology I employ, I use the same example of four customers that Dr. Burtis cites:

> *Consider a situation in which there are four customers, all buying the same product. Two customers are brokers and two customers are distributors. One broker's prices increase over time and the other broker's prices remain constant over time. Averaging the brokers' prices would result in a price series that increases over time. Further assume that one distributor's prices fall over time and the other distributor's prices rise sharply, so that the average of the two distributors' prices increases somewhat over time. Correlating the average of the brokers' prices with the average of the distributors' prices would result in a positive correlation, given that both the averaged brokers' price and the averaged distributors' price increase over time. However, in actuality, there would be no correlation between the two brokers' prices and negative correlation between one of the broker's prices and one of the distributor's prices. Averaging of the individual customers' prices obscures these true relationships and leads to a false conclusion about how the prices paid by these customers relate to one another.*[184]

106.   Figure 7 below illustrates a scenario that is consistent with Dr. Burtis' example and her logic concerning the issue with aggregating for correlation analyses. This chart shows how averaging prices for distributors and brokers loses the variation in the individual customers' prices, and that the high correlation between the aggregate series (see the purple and black lines below) is misleading. The correlation coefficient between the two aggregate groups (brokers and distributors) in this example is high and positive at 0.9956[185], despite some of the individual customers having no correlation or being negatively correlated (see Figure 8 below).

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[184] Burtis, p. 507.

[185] See backup production.

Figure 7. Correlation Aggregation Example
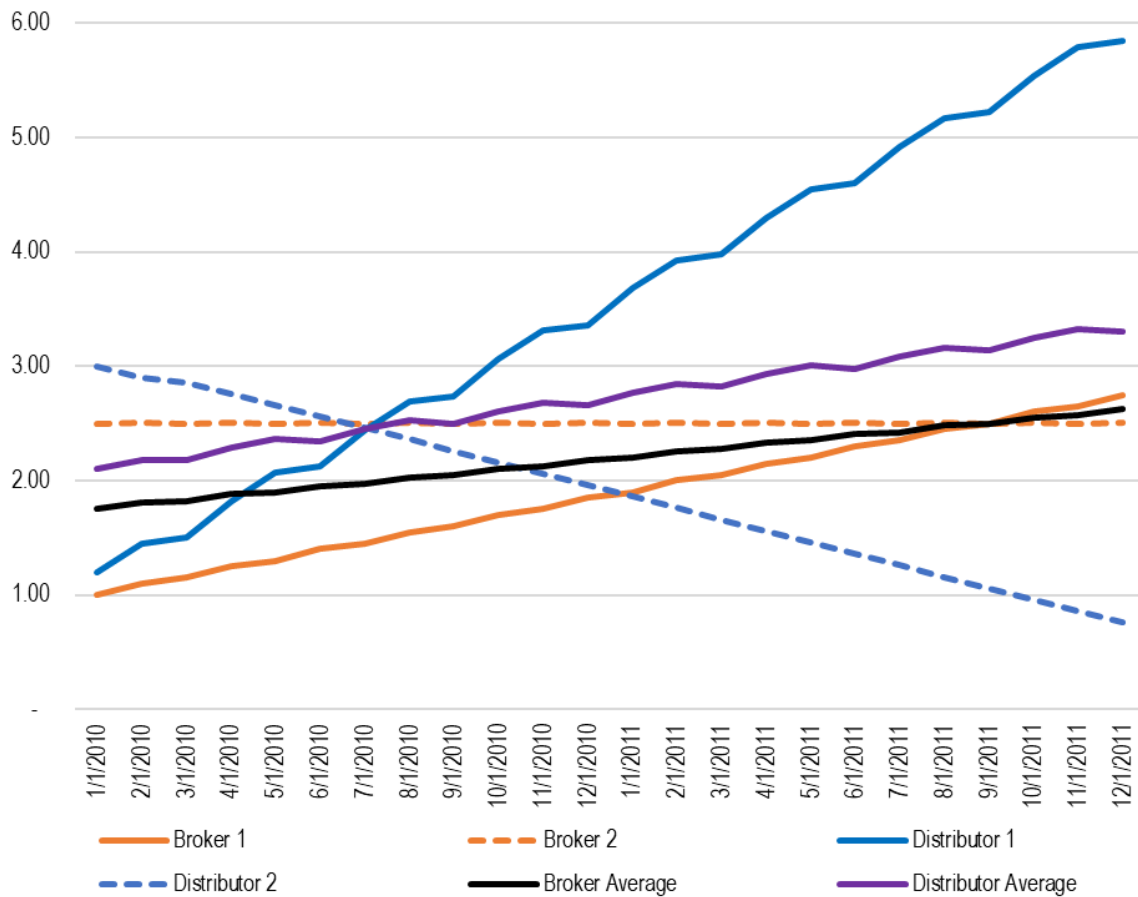
Figure 8. Correlation Aggregation Example - Coefficients[186]

	Broker 1	Broker 2	Distributor 1	Distributor 2
Broker 1	1.0000			
Broker 2	0.0961	1.0000		
Distributor 1	0.9987	0.0724	1.0000	
Distributor 2	(0.9995)	(0.0731)	(0.9989)	1.0000

107.   The correlation methodology I employ, however, does not obfuscate important price differences, since it controls for the differences across customers in creating the distributor and

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[186] Consistent with Dr. Burtis's example, there is no correlation between the two brokers' prices and negative correlation between one of the broker's prices and one of the distributor's prices. See Burtis, p. 507.

broker values. Using this example, my approach generates a correlation coefficient of 0.4385, which a) is more indicative of the actual underlying relationships between the prices paid by brokers and distributors and b) would not meet the threshold of correlation that I presented in my analyses.[187] Thus, the method I utilized is inconsistent with Dr. Burtis' example and the concerns regarding aggregation that Dr. Burtis and Dr. Haider voice. The example above demonstrates how these concerns regarding aggregation are not relevant nor applicable to the correlation analyses I present in the Mangum Report. In fact, this example demonstrates how my correlation analysis appropriately controls for pricing variation, and does not suffer from the empirical issues, as Dr. Haider claims.

B. Dr. Haider's Analysis of "Price Responses" Cannot Assess Common Impact

108.   My correlation analysis demonstrates that prices across Defendants, geographic areas, and DPPs for each of the pork product categories respond similarly to common market forces.[188] While Dr. Haider does not appear to dispute my finding that pork prices were highly correlated, she purports to find that products and customers do not respond to certain market events in a common way, based on her analysis of "price responses" by individual customers.[189] Dr. Haider claims to "test" for such price responses around three separate "industry events:" 1) the "onset of the alleged agreement in January 2009,"[190] 2) the "outbreak of the disease H1N1 in 2009,"[191] and 3) the "outbreak of PEDv in 2013–14."[192]

109.   As an initial point, while my correlation analysis examines co-movement of prices from 2005 through 2019, Dr. Haider's analysis is severely limited to a comparison of price changes for three sets of six-month snapshots. She compares only the average price six months prior to an "event" (the "control period") to the average price during the six months following the "event" (the "treatment period").[193] Because my more complete correlation analysis uses far more data

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[187] In other words, it would not be included in the tabulation of customer-product combinations that show a high degree of correlation. See backup production.

[188] Mangum Report, Section IV.D.

[189] Haider Report, Section VI.F.2.

[190] Haider Report, ¶¶164–167.

[191] Haider Report, ¶¶168–171.

[192] Haider Report, ¶¶172–175.

[193] Dr. Haider additionally "tests" price responses during 3-month windows before and after certain events, as well as "tests" alternative event dates. See Haider Report, footnotes 336, 344, and 357.

and information over a more expansive period of time, it is a superior method for assessing whether the prices that individual customers face respond to common market forces.

110.   In "support" of her analysis, Dr. Haider cited no academic literature, nor method accepted by the courts, for her asserted relevant threshold for the "common price response among direct purchasers." [194] Instead, she randomly quantifies customer-product combinations by the direction of a price change in the six months before and after the "event" date, and then simply claims her empirical representations reflect proper assessments from appropriate methods.

111.   Further, Dr. Haider's method attributes average before-and-after prices changes to one isolated event, and disregards the effects of other supply and demand factors and varying market conditions which may also affect the prices in opposite directions. This highly restricted evaluation (restricted to a single event) demonstrates the important role of my regression analyses, which uses all the available and reliable data, without event restrictions, in statistically disentangling and understanding the relationship between an explanatory variable (*e.g.*, feed costs, price of other proteins) and the variable of interest (*e.g.*, the prices of pork products). The effect of the limitation in Dr. Haider's approach can be demonstrated by using her own price response analysis but instead utilizing alternative time periods that actually contain price changes. By utilizing timeframes that contain price changes, one can more appropriately assess the extent to which the price changes are common. As explained below, adjusting Dr. Haider's price response analysis to include periods of time where prices change more meaningfully shows a high proportion of "common responses," which is consistent with my opinions in this case.

112.   Further, the conclusions that Dr. Haider draws from her flawed analysis are unfounded. Dr. Haider suggests that, to the extent there are some factors that only affect certain customers, there is no reason to expect all (or virtually all) direct purchasers to have been affected in a common way by the alleged conspiracy. Dr. Haider is simply wrong. As I explained throughout the Mangum Report, the alleged conspiracy affected the price of all relevant products purchased by DPPs because of the effect of supply restrictions and pricing actions on market prices. That there can also be some customer-specific or product-specific factors—such as

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[194] Haider Report, ¶156.

changes in the quantity purchased or changes in the negotiating ability of the customer—has no bearing on the common effect of a common factor, such as the alleged conspiracy.[195] For example, suppose a customer greatly expands its purchasing volume and therefore qualifies for discounts or rebates it previously could not obtain; such a scenario may explain observed differences in reaction to market events, but it does not mean they would be immune to anticompetitive effects. Similarly, as I discussed in the Mangum Report, some pork products are sold through short-term fixed-price contracts. A customer purchasing under such a contract would not show any price response over a period of time that is shorter than the duration of the contract. But that same customer would be impacted over the longer time period beyond the length of the contract. The best available estimate of any customer's overcharges are the Class-wide overcharges reported in the Mangum Report.

1. *Dr. Haider's Price Response Analysis Disregards Market Factors*

113.   The reliability of Dr. Haider's claim that there was a lack of common response among direct purchasers is undermined by the fact that she a) looked only at short snapshots in time, and b) failed to account for countervailing effects from different market factors. For example, Dr. Haider argues that January 2009 constituted a major industry shock, and that if there was common impact, pork prices would be expected to change uniformly and in the same direction in response to the changing economic conditions.[196] The problem with this logic is that the changes that were taking place had different effects, in terms of direction and magnitude, on the price of pork products. These economic forces include changes in demand generally, demand for specific pork part categories, changes in feed costs and other costs; changes in the supply of other proteins; *and* the start of the alleged conspiracy. Some of these events would have a positive effect on pork prices, others would have a negative effect, with an uncertain overall net effect on price (from a theoretical perspective).[197] All of the time periods used by

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[195] In other words, unless the customer- or product-specific change was caused specifically by the conspiracy (and it is unlikely cartel participants would inform their customers of their cartel activities), there is no reason to assume it would not have happened anyway, and thus it has no relevance to the question of common impact.

[196] Haider Report, ¶¶164–167.

[197] From a theoretical perspective, feed costs increasing and an alleged conspiracy restricting quantity available would likely increase the price to a direct purchaser. Gas prices decreasing, "weakened" demand, and excess supply of substitutes would likely decrease the price to a direct purchaser.

Dr. Haider suffer from this fundamental issue and are therefore far less informative than my approach for assessing common impact and calculating damages.

114.   When testing price responses due to the "onset of the alleged agreement in January 2009," Dr. Haider asserts that lower prices in the second half of 2008 should be followed by higher prices in the first half of 2009. Further, testing the H1N1 outbreak in June 2009, Dr. Haider expects higher prices in the first half of 2009 to be followed by lower prices in the second half of 2009. However, in these analyses, Dr. Haider disregards the seasonality of pork prices, which fluctuate from month to month in different patterns for different cuts. By choosing limited, six-month comparison windows, Dr. Haider fails to control for expected changes or variations in price due to seasonal patterns.

Figure 9. CME Lean Hog and Pork Cutout Indices, 2015–2022[198]
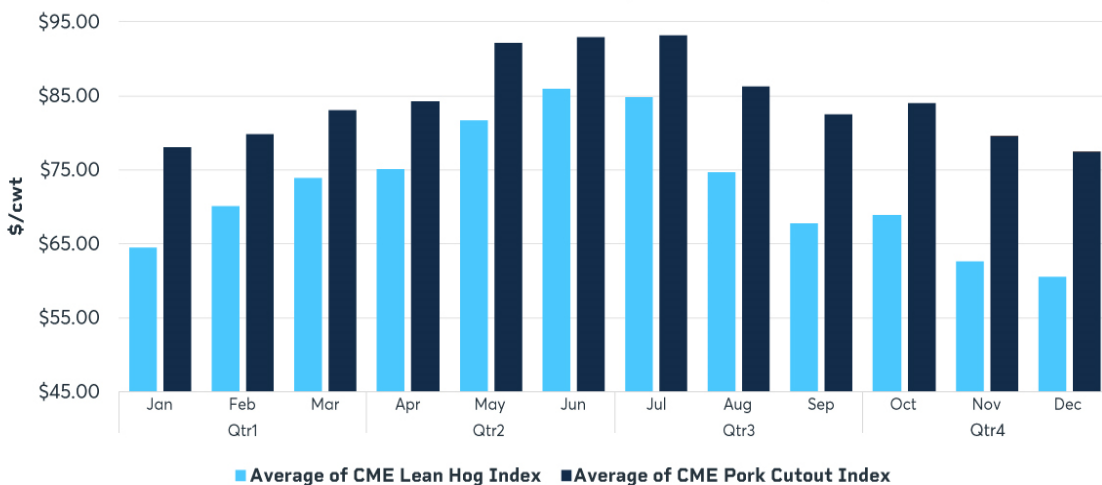
Source: CME Group

115.   As discussed above, while Dr. Haider examines unnecessarily short snapshots (six months) to assess the impact of alleged conduct that lasted nearly a decade, I treat the period from January 2009 through the end of June 2018 as a single "Conspiracy Period." I then utilize multivariate regression models to assess the impact on prices throughout the duration of that multi-year period. Dr. Haider, however, appears to treat the "onset of the alleged agreement in

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[198] See Anne Krema and Emily Balsamo, "Seasonality in Hogs vs Pork: More Than Just Grilling Season," *Open Markets,* Sept. 27, 2022, https://www.cmegroup.com/openmarkets/agriculture/2022/Seasonality-in-Hogs-vs-Pork-More-Than-Just-Grilling-Season.html.

January 2009" as a one-time shock or structural break in the market, which leads her to search for immediate price response across all market participants. I already showed above that the effects of the alleged conspiracy began appearing through increased prices later in 2008 and continued—and even strengthened—as time went on. Indeed, average prices increased further during the 6-month period one year after the "onset" of the alleged conspiracy.[199] This shows that the results of Dr. Haider's methods—even when not controlling for other potential confounding factors—are highly contingent on the selection of dates and durations of comparison periods.

2. Appropriate Benchmark and Treatment Period Clearly Demonstrate the Common Response of Pork Prices to Increasing Market Prices

116.   It is not surprising that Dr. Haider finds variation in pricing responses when she is looking at time periods that do not display consistent changes in market prices. To demonstrate that increasing market prices for pork, which would result from Defendants' alleged supply restriction, can show a common response when analyzed correctly, I conducted an analysis similar to Dr. Haider's, but with one critical adjustment: I analyze prices for pork products during times where the market prices were changing substantially from the control period to the treatment period. By choosing these time periods, the "signal" of changes in market prices can outweigh the "noise" of price changes that are specific to particular customer-product combinations. In other words, I analyze actual changes in price in order to determine the extent to which these price changes are common. Using July 2009–December 2009 as a control period and the following year (January 2010–June 2010) as a treatment period allows me to determine how these price changes may be common or different between customers and Defendants.

117.   For the period of price volatility around January 2010, there is a more common, widespread price increase response for the customer-product combinations for Bacon and Belly products.[200] In fact, as shown in Figures 10 and 11, price increases during this period were observed for:

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[199] Put another way, Dr. Haider's analysis would not find any "response" for a customer whose prices were based on a fixed contract that spanned her 6-month window but went up during the seventh month. It similarly may not find a "response" for a customer whose prices went up immediately prior to the start of the Conspiracy Period and then remained steady for the following 6 months.

[200] See **Appendix C** for price response analyses for other pork products.

- 99.5% of customer-product combinations for JBS's and Tyson's sales of Belly,

- 95.5% of customer-product combinations for Seaboard's sales of Belly,

- 95.5% of customer-product combinations for Seaboard's sales of Bacon, and

- 96.8% of customer-product combinations of Hormel's sales of Bacon.

Figure 10. Modified Haider Price Response Analysis, Bacon Jan. 2010, +/−6 months
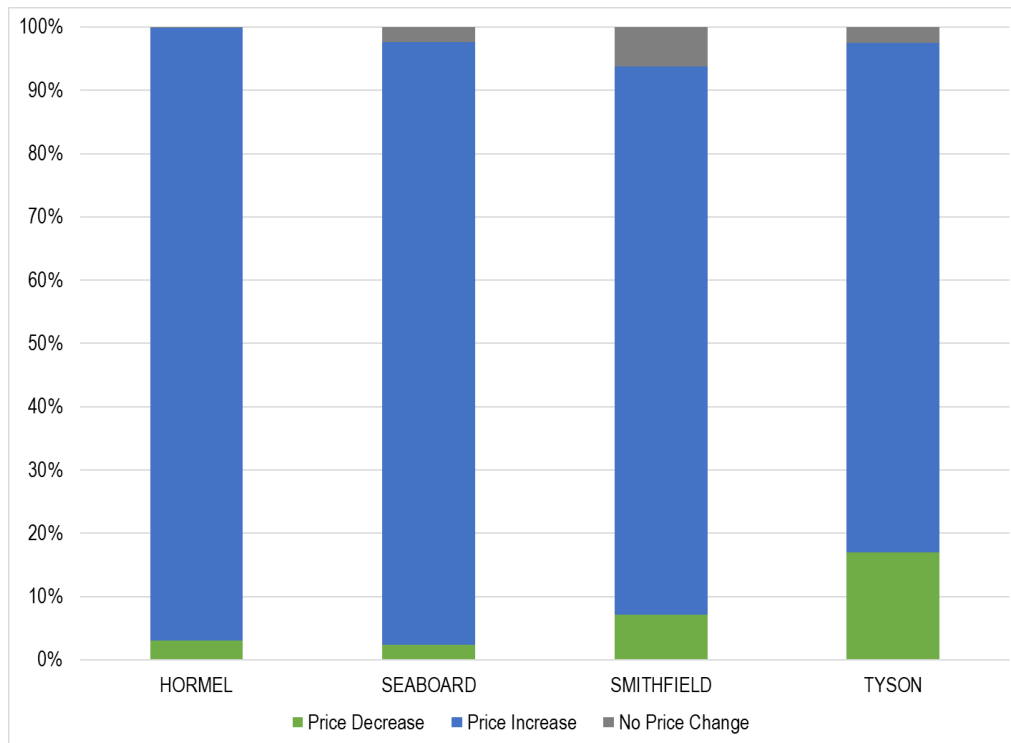
Figure 11. Modified Haider Price Response Analysis, Belly Jan. 2010, +/−6 months
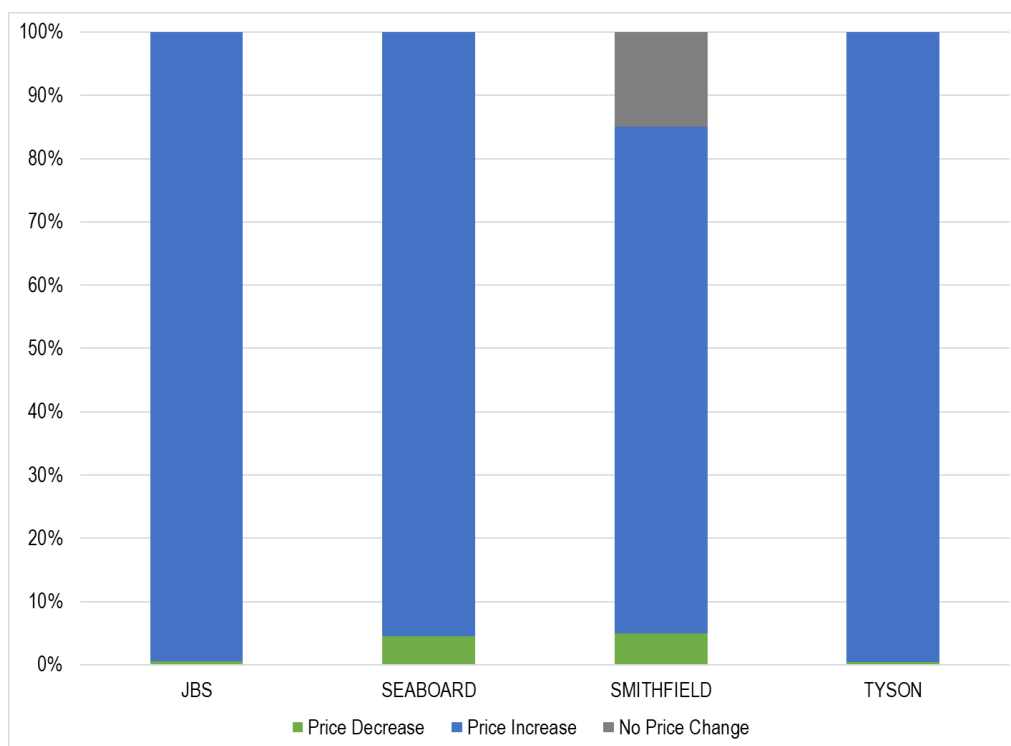
118.   Another test of the price response during a period of price volatility allows the "event" itself to be 6-months long in duration—rather than an "overnight" change in the marketplace. This is particularly appropriate given the nature of the allegations in this case, the life cycle of hogs, the duration of hog contracts, and the ability of packers to utilize cold storage and export markets to affect available supplies of pork. Using Dr. Haider's methodology, I also test for the price response using July 2009–December 2009 as a control period and July 2010–December 2010 as a treatment period, which follows a 6-month "event period." This test demonstrates an even stronger indication of widespread price increases for the customer-product combinations for Bacon (Figure 12) and Belly (Figure 13) sales.[201]
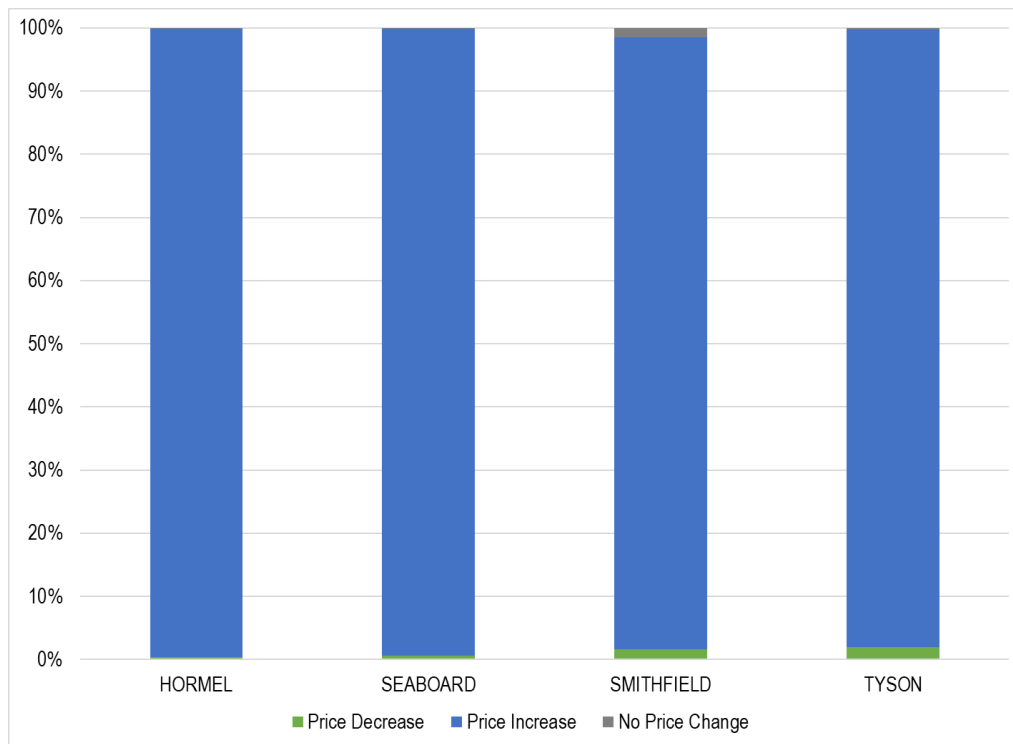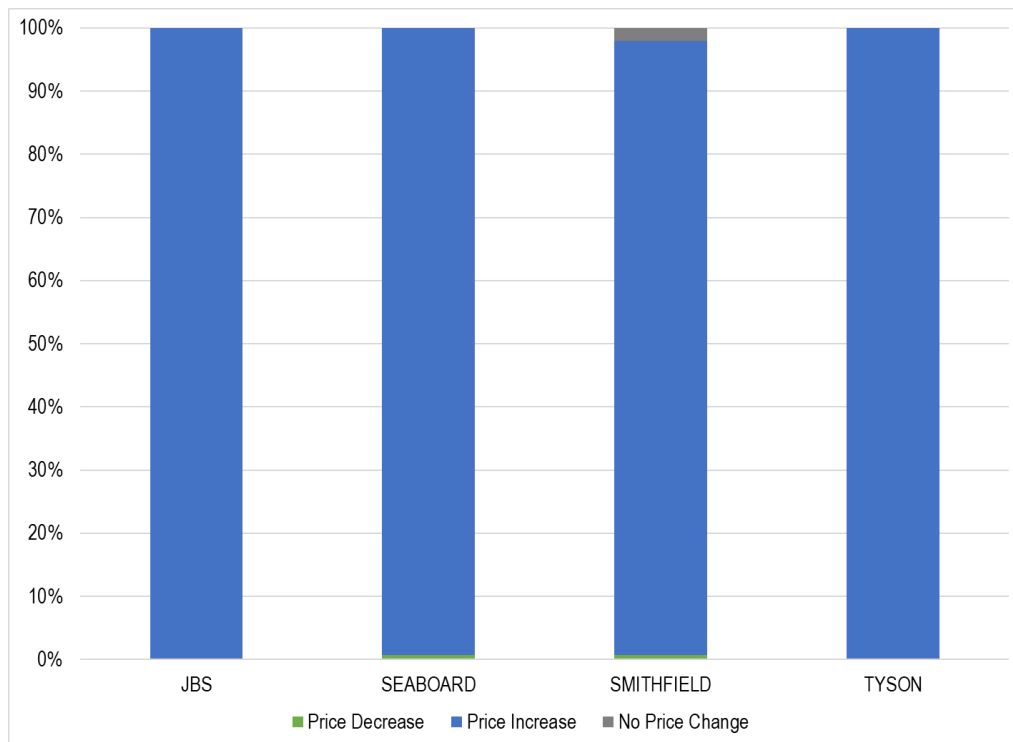
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[201] See **Appendix C** for price response analyses for other pork products.

Figure 12. Modified Haider Price Response Analysis, Bacon Jan.–June 2010, +/− 6 months

Figure 13. Modified Haider Price Response Analysis, Belly Jan.–June 2010, +/− 6 months

119.   Additionally, certain of Dr. Haider's statements made to describe her price response analysis findings are in fact a) not supported by sufficient data, and b) indicate either deficiencies in Defendants' data production or different business practices.[202] Specifically:

- Hormel did not produce meaningful data for the sales of Belly products, and therefore Dr. Haider's statement that "[f]or Hormel, all customer/product combinations experienced no change"[203] is misleading. As evidenced by Dr. Haider's own analysis, this conclusion is made based on only one customer/product combination for Abbotts Meats and does not apply to any other customer.

- Smithfield produced sparse and inconsistent data prior to August 2009,[204] which invalidates any statements that supposedly apply to *all* customer/product combinations for the period spanning 2008 and 2009. For example, Dr. Haider's price response analysis for the onset of the alleged conspiracy in January 2009 for Smithfield's sales of fresh ham is based on only four customers (Carl Buddig & Co, Gusto Packing, Plumrose USA and Rich's). Thus, Dr Haider's "finding" of a lack of meaningful response for the Smithfield customers around 2009 is less an indication of disparate effects, and more a demonstration of the insufficient data to draw any meaningful conclusions for that period.

C. Dr. Haider's "Top Purchaser" Analysis is Misleading & Fails to Support Her Claims

120.   In the Mangum Report, my demonstration that prices among the top 50 customers were substantially similar over time is further evidence of common impact, particularly when combined with the evidence regarding market factors and the results of my econometric models. In her attempt to demonstrate that my own econometric models do not provide evidence of common impact, Dr. Haider modified my regression models by interacting the conduct dummy variable with the customer name variable for "top direct purchasers" in the data I used for estimation.[205] In other words, Dr. Haider calculates a single—positive and statistically significant—overcharge for most customers, but then also estimates sub-

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[202] That is, a Defendant may not produce meaningful quantities of sales data for a particular type of pork because they did not retain such records, or because they do not (for whatever reason) sell significant volumes of that type of pork.

[203] Haider Report, ¶166.

[204] Mangum Report, ¶223 and Figures 64–65.

[205] Haider Report, ¶¶145–146.

regressions for any customers that meet her definition of "top direct purchaser."[206] Dr. Haider's approach leads to positive, statistically significant overcharges for 74% of "top direct purchasers" she identified, while over 90% show a positive overcharge (statistically significant or otherwise).[207] Amazingly, her results, that only 13 "top direct purchasers" (less than 2%) show a negative and statistically significant overcharge, largely support my opinions on common impact.[208] Nevertheless, as set forth below, Dr. Haider's methodology and tests are inappropriate and do not undermine my models and the opinions set forth in the Mangum Report.

1. Dr. Haider's Own Results Overwhelmingly Show Positive Overcharges

121.   Indeed, while Dr. Haider emphasizes only the statistically significant results, the vast majority of her remaining "top direct purchasers" still showed positive results. While this ultimately serves to support my own conclusions, it is nevertheless important to recognize flaws in Dr. Haider's analysis. For example, while Dr. Haider attempts to deflect the issue of sample sizes, her ability to find statistically significant results is clearly and heavily influenced by the number of observations available for analysis. By slicing the data up into nearly 700 samples, Dr. Haider makes it more difficult to identify statistically significant estimates, and then points to results that are not statistically significant to support her conclusion that some customers did not pay an overcharge. But Dr. Haider has not demonstrated that 26% of customers were not overcharged; she has merely demonstrated that 26% of her selected "top customers" have insufficient samples in her model from which to draw firm conclusions. Dr. Haider presents no evidence, discussion, or theory as to why or how these customers could have avoided an overcharge, or why their estimates differ from the vast majority of other direct purchasers. In the absence of such a theory or evidence, it is far more likely that her results are simply statistical noise due to her selection of small samples.

122.   Below is an example of a situation involving a "top direct purchaser" a) for whom Dr. Haider did not find positive and statistically significant overcharges, but b) in fact paid similar—or

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[206] *Id.*

[207] Per Dr. Haider's Exhibit 31, there are 694 "top customers" in her analysis, but 12 of them do not estimate due to insufficient data. Thus, there are only 682 with estimated overcharges. Of these 682 customers, 508 are positive and statistically significant. Another 119 are positive and not statistically significant. See Haider Report, Exhibit 31.

[208] Haider Report, Exhibit 31.

even higher—prices compared to other customers with positive and statistically significant overcharges. This example strongly suggests that the customer could not have avoided the impact of the alleged conspiracy, and that the results of Dr. Haider's model are simply statistical noise due to her slice-and-dice approach to estimation.

- Based on Dr. Haider's analysis for her Exhibit 31, Food 4 Less has a negative and statistically significant overcharge coefficient. While this customer met Dr. Haider's criteria to have at least 50 monthly observations in the benchmark and proposed Class Period (2014–2018), there is still poor data coverage throughout the entire analysis period, as presented in Figure 14. Notably, the data available in the benchmark are only for Loin, Shoulder, Fresh Ham and Ribs, while Bacon sales data are only available during the Conspiracy Period but not in the benchmark.

Figure 14. Average Monthly Prices Paid by Food 4 Less, by Pork Product Category
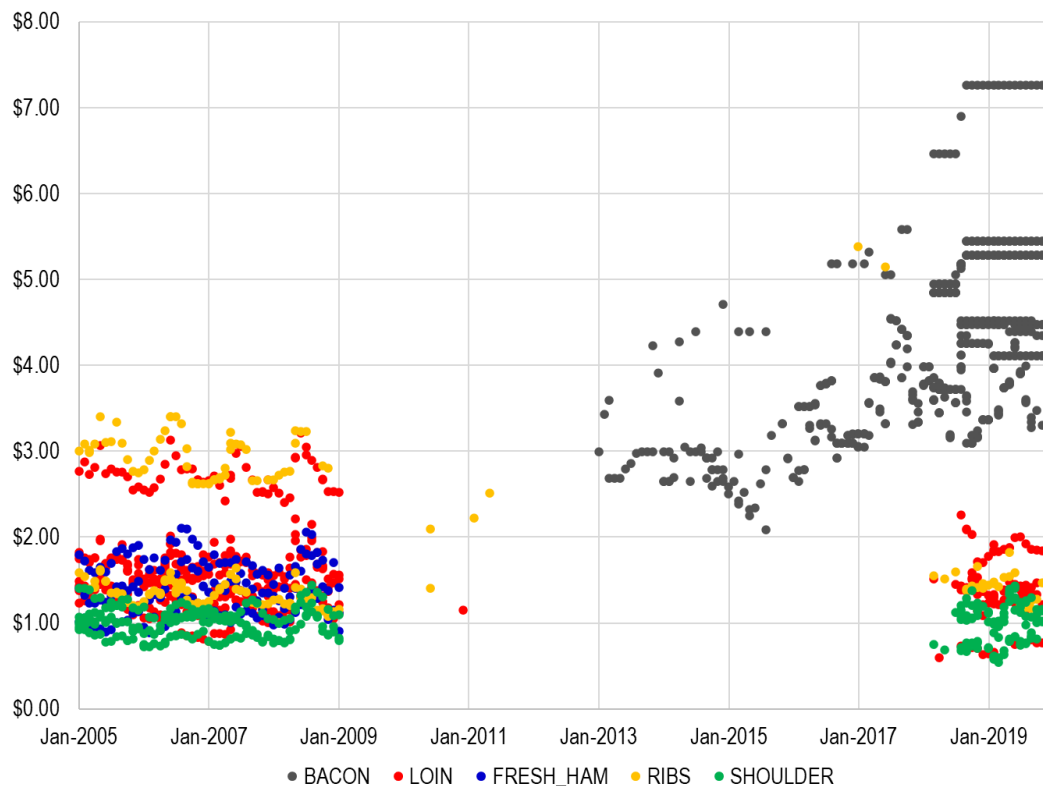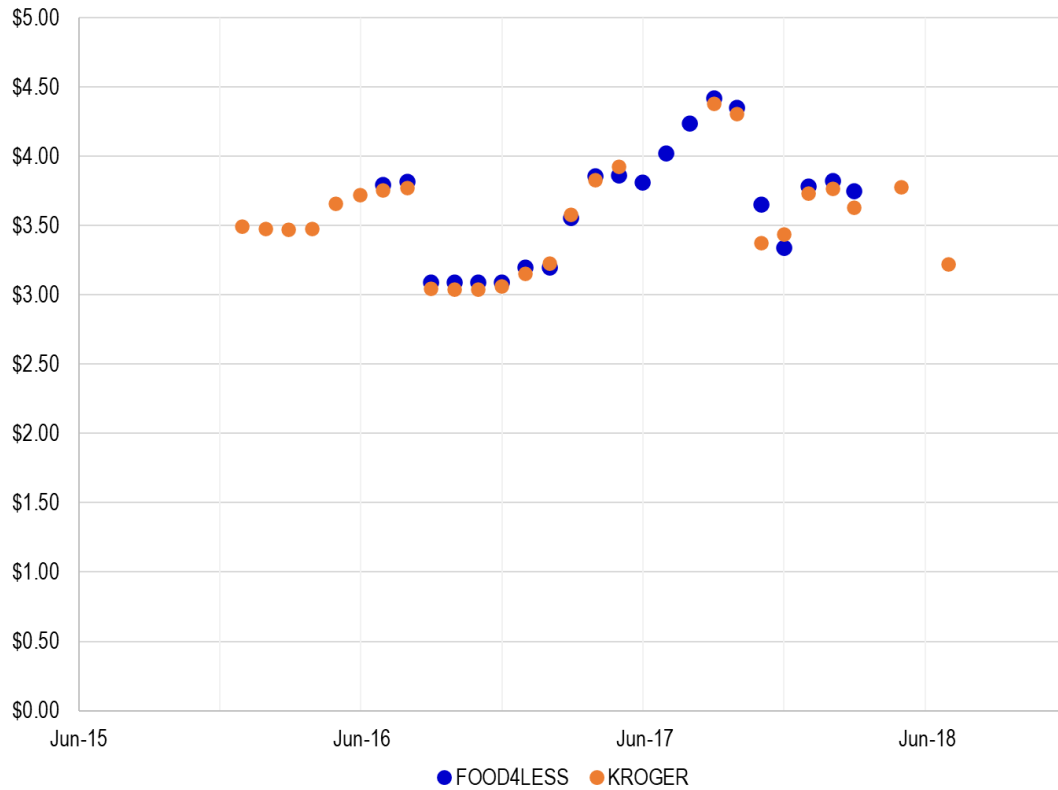

- As shown in Figure 15 and Figure 16, for certain Bacon products that Food 4 Less purchased during the Conspiracy Period, they paid similar or even higher prices

compared to their parent company, Kroger, for whom Dr. Haider finds positive and statistically significant overcharge.

Figure 15. Average Monthly Prices for Bacon Product 8768806725 by Food 4 Less & Kroger

Figure 16. Average Monthly Prices for Bacon Product 8768842030 by Food 4 Less & Kroger
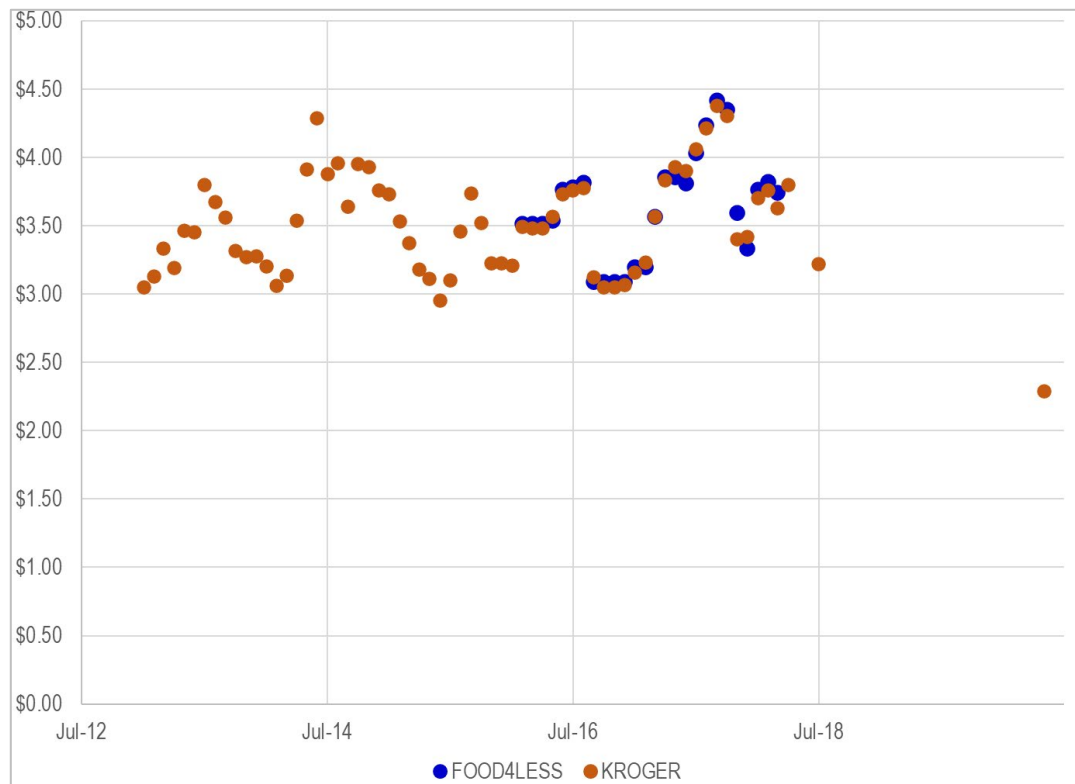
123.   The example above is not unique. A number of other customers—for whom Dr. Haider did not find positive and statistically significant overcharges—experienced similar price patterns during the analysis period as customers with positive and significant overcharges. The monthly average prices for different cuts of pork are shown for additional DPPs (such as Aldi, Publix Supermarkets, Meijer and MBM) in **Appendix D**. Furthermore, the high degree of similarity in pricing patterns between these customers is supported by high correlation coefficients.

2.   *Dr. Haider Inappropriately Allows the Post-Period to Vary Across Customers*

124.   As explained above, Dr. Haider asserts that she is testing my regression models by allowing the overcharge to vary across customers. This is accomplished technically by interacting the Conspiracy Period dummy variable with dummy variables for each individual customer. However, in a footnote, Dr. Haider discloses that she also makes an additional change to my models: she interacts the post-period dummy variable with each individual customer.[209]

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[209] Haider Report, footnote 264.

Dr. Haider provides no motivation, explanation, or justification for this choice. As the post-period dummy variable is not used to calculate damages or demonstrate anticompetitive impact, it does not require any more (or less) interest than any of the other explanatory variables. If Dr. Haider believes it is appropriate to interact the post-period dummy variable with customers, then it is unclear why she would not also interact all other dummy variables (*e.g.*, the COVID period or H1N1 fixed effects) and continuous variables (*e.g.*, costs, GDP, and piglet mortality) with individual customer names.

125.   Upon closer examination, it appears that Dr. Haider chose an additional variable to interact because doing so gives her a favorable outcome. In Haider Exhibit 31, Dr. Haider reports that 74% (508 of the 682[210]) of customers with estimates showed a positive and statistically significant overcharge. First and foremost, Dr. Haider has not employed the scientific method here – she has not presented a hypothesis that she is testing, which is foundation for evaluating statistical significance. The concept of "statistical significance" has meaning in the context of evaluating alternative substantiated hypotheses (H0 and H1), and whether the null hypothesis (H0) can be rejected.[211] Hypothesis testing involves more than a simple mathematical computation (*i.e.*, dividing a coefficient by its standard error). This is the problem with Dr. Haider's approach—she performed mathematical computations without formulating hypotheses, and thus the phrase "statistically significant" loses its meaning. Dr. Haider makes no apparent attempt to understand, interpret, or explain her results—the computation alone represents the end of her analysis.

126.   The fundamental failings of her approach aside, the vast majority of customers without positive and statistically significant overcharges still had positive overcharge estimates. Indeed, Dr. Haider's results reveal that her model estimates positive overcharges for 92% (508 positive and significant plus 119 positive and insignificant) of the 682 individual customers in her model.[212] While this result on its own would point toward common impact, the results change considerably when individual customers are not interacted with the post-period dummy. As shown in Figure 17 below, had Dr. Haider simply interacted the conduct variable with

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[210] There were 12 customers for whom parameters could not be estimated in Dr. Haider's model.

[211] *See, e.g.,* Damodar Gujarati, *Basic Econometrics,* 4th ed. (New York, NY: McGraw Hill, 2003), pp. 126–128.

[212] Haider Report, Figure 31.

individual customer names—as she claimed to be doing in the body of her report text—then the share of customers who return positive and statistically significant overcharges rises from 74% to 90%. Further, three quarters of the remaining 72 customers who do not show a positive and statistically significant overcharge still show positive (but not statistically significant) overcharges. In contrast, only 5 customers—*less than 1%*—show a negative, statistically significant overcharge estimate.

Figure 17. Modified Haider Ex. 31: Summary of Customer-Specific Overcharge Coefficients for "Top Direct Purchasers"

|	Alleged Conduct Period (Interaction for Only Alleged Conduct Period)
	Count of Direct Purchasers
Positive and Statistically Significant[2]	620
Positive and Not Statistically Significant	53
Negative and Statistically Significant	5
Negative and Not Statistically Significant	14
Total Number of Top Direct Purchasers with No Positive Statistically Significant Overcharge	72
Not Estimated[3]	2
Total Top Direct Purchasers	**694**

Notes:

1. Top direct purchasers are those with at least 50 observations in the proposed class period and 50 observations in the benchmark period.

2. Statistical significance is reported at the 5% significance level.

3. This is when a coefficient is not estimated for the alleged conduct period.

Sources: Defendants' transaction data and Haider Report Exhibit 31 backup.

Figure 18. Customer-Specific Coefficients for the Conspiracy Period for Dr. Haider's "Top Customers," (Conspiracy Period Interactions Only)
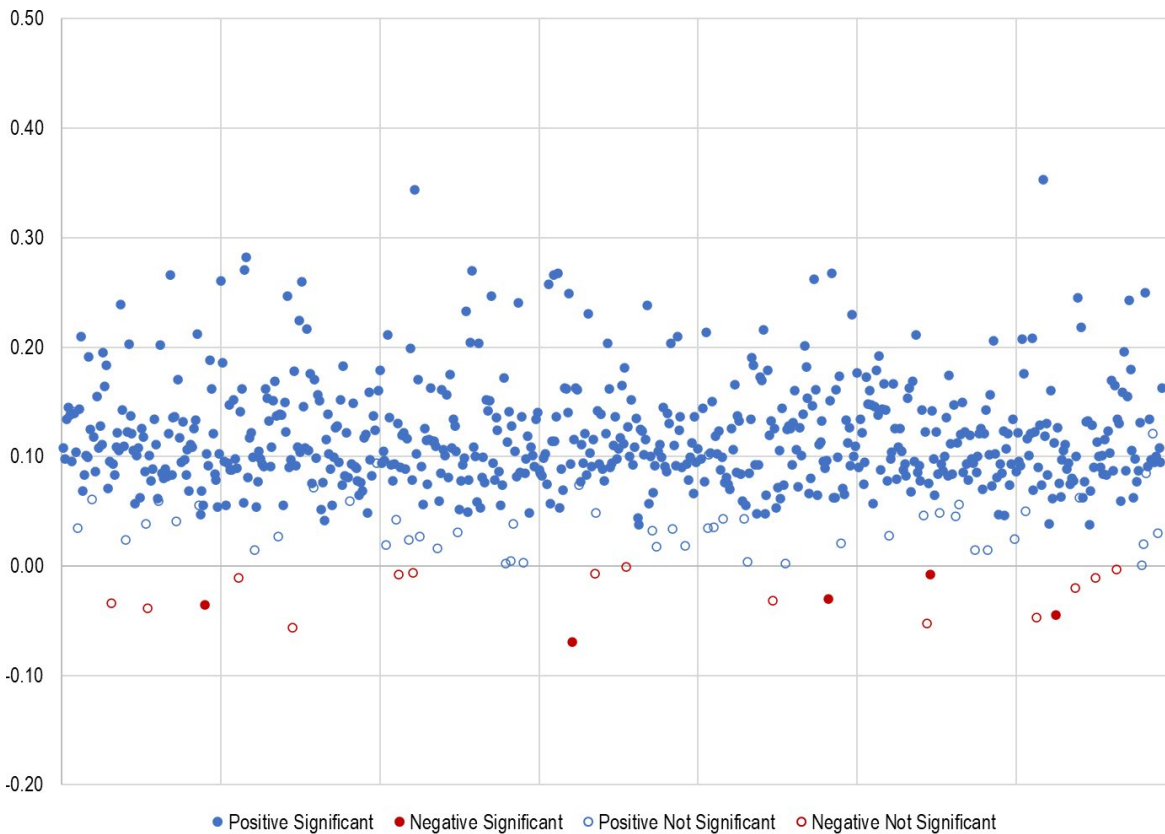
D. Dr. Haider Misconstrues My Predicted But-For Price Analysis

127.   In Section IV of the Mangum Report, I detail evidence supporting my opinion that all or nearly all DPPs were impacted by the alleged conspiracy including: a) market structure characteristics that made it difficult for customers to have avoided price increases, b) the pricing mechanisms used by Defendants and DPPs, and c) my own analysis of the pricing behavior in the pork market. In Section V of the Mangum Report, I explain my finding of impact including my direct overcharge modelling approach and the estimated results. I then looked at whether, based on my previous findings that 1) all or nearly all DPPs were impacted,[213] and 2) the magnitude of that impact (ranging by cut from 4.3% on Loin products to 19.1% on Belly

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[213] Mangum Report, Section IV.

products[214]), there was a significant portion of DPP Class Members that were unharmed. I found that less than 1% of the DPPs in the regression data were uninjured, *i.e.*, never paid a price during the Class Period that was higher than the predicted but-for level.[215]

128.   Dr. Haider claims that this approach "does not, in fact, study whether any particular direct purchaser paid higher prices as a result of the alleged conduct."[216] Dr. Haider either fails to understand the fundamentals of this analysis or purposely misconstrues my opinion. I do not rely on this analysis to establish individual estimates of overcharges from the alleged conspiracy.[217] Rather, my analysis refutes anticipated criticisms by Defendants and their experts that these findings mask uninjured class members as a result of averaging. By analyzing and controlling for the transactions of individual DPP Class members, I confirmed that all or nearly all DPP Class members paid prices that exceeded my models' predicted but-for prices, and thus were impacted by the alleged conspiracy. Indeed, in light of what we know about the structure of the pork market and my opinions regarding impact, I agree with Dr. Haider that this is not surprising.[218]

IV.   DIRECT OVERCHARGE ESTIMATION AND DAMAGES CALCULATION

129.   In the Mangum Report, I discussed the use of econometric techniques to estimate overcharges in class action antitrust matter like this case. After explaining the design and specification of my regression models for this matter, as well as the data used for estimation, I showed that my

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[214] Mangum Report, Figure 75. The overcharge coefficients are positive and statistically significant for all individual cuts, with Belly showing the highest overcharge at 19.1%, followed by Bacon (13.9%) Shoulder (11.5%), and Ribs (8.0%). The lowest overcharges are for Fresh Ham (4.7%) and Loin (4.3%).

[215] Mangum Report, ¶256.

[216] Haider Report, ¶149.

[217] As I explained the Mangum Report, the factors I previously described are a sufficient basis to reach a conclusion that the impact from the alleged conspiracy would be common to all DPPs. There include: a) the pork products at issue are highly commoditized in nature; b) Defendants dominate the pork market; c) there were significant barriers to entry into the pork market; d) Defendants have had, through numerous trade organizations and Agri Stats, opportunities to collude, monitor, and enforce the alleged conspiracy; e) pork prices are based on market values, which are tied to the available supply of pork, which would have necessarily been affected by the alleged conspiracy; and f) statistical analysis of Defendants' prices shows consistently high degrees of correlation across multiple relevant dimensions. See Mangum Report, ¶¶253–254.

[218] That is, given the commodity-like nature of the products at issue, the existence of high barriers to entry, and the widespread use of common pricing mechanisms across customers, regions, and products, it would be surprising to find results contrary to what I have shown.

econometric models are appropriate and capable of estimating overcharges on a class-wide basis. While the models can be used to estimate an overall overcharge for all class pork products, the results in my report showed overcharges separately for Bacon, Belly, Ribs, Loins, Fresh Ham, and Shoulders.

130.   In her report, Dr. Haider takes issue with the specification and application of my econometric models and introduces a number of changes to them. Dr. Haider provides no alternative models to control for any other factors which could explain the overcharges that I find, but simply conducts irrelevant "tests" without a sound economic basis to support her claim that my overcharge models are not reliable.[219] According to Dr. Haider, these "tests" demonstrate purported flaws in my models, and therefore indicate that the models are unreliable. In the sections below, I address Dr. Haider's changes to my regression models and show that, taken individually or collectively, they do not overturn my analyses or conclusions.

A. Dr. Haider's Purported "Testing" of My Regression Models Is Flawed and Leads to Erroneous Conclusions

131.   The first change Dr. Haider introduces to my econometric models is to split the conduct variable (the variable used to measure anticompetitive impact) into two pieces centered around the start of the Class Period.[220] Second, Dr. Haider substitutes hog *purchase* data for all or part of the hog *cost* data used in my analysis.[221] Third, Dr. Haider inserts a dummy variable over all observations from the year 2008 to "account for industry events."[222] Fourth, Dr. Haider treats the year 2008 as part of the Conspiracy Period.[223] Fifth, Dr. Haider changes the way piglet mortality data are used in my econometric models.[224] Sixth, Dr. Haider modifies my regression models by interacting customer fixed effects with the Conspiracy Period variable, thereby attempting to estimate approximately 700 different overcharges.[225] Dr. Haider

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[219] Dr. Haider does not endorse any of her models and does not presenting them as appropriate regressions for determining price impact (or lack thereof) of the conspiracy. See Haider Deposition, p. 142:11–18.

[220] Haider Report, Exhibit 12. Recall that the Conspiracy Period and the Class Period are not the same in this case due to the Court's ruling on the impact of the applicable statute of limitations.

[221] Haider Report, Exhibits 17 and 20.

[222] Haider Report, Exhibit 23.

[223] Haider Report, Exhibit 26.

[224] Haider Report, Exhibit 29.

[225] Haider Report, Exhibit 31. This is the "Top Customer" analysis I discussed in an earlier section of this report.

suggests that each of these modifications—individually or collectively—"overturns" the results of my analysis.[226] As discussed below, Dr. Haider's numerous modifications are, individually and collectively, inappropriate, misleading, and unscientific. In fact, they lack plausible scientific or economic bases and appear to just be attempts to "break" a statistical model.[227] They are also, in general, unpersuasive. This is because, despite the inappropriate nature of these modifications, Dr. Haider's ultimate intended conclusion—that my results are overturned—is simply unsupported. Indeed, even if the results from her inappropriate dissecting of my models are taken at face value, they largely lead to the same fundamental conclusion that my models can be applied on a class-wide basis to calculate class-wide damages in this matter.

1.   *"Splitting" the Conspiracy Period is Misguided, Inappropriate, and Unscientific*

132.   The start of the proposed Class Period is not aligned with the alleged conduct in this matter. Rather, it is a point in time determined by the Court based on a purely legal issue: the statute of limitations.[228] Since the purpose of my economic models is to isolate the impact of the alleged conspiracy, it is appropriate and important to measure the impact of the alleged conspiracy during the period that the alleged anticompetitive conduct took place (*i.e.*, 2009–2018).[229] Accordingly, while the damages I calculated were limited by the statute of limitations, my damages models contain no such limitation. Conversely, it is inappropriate to impose a statistically and econometrically arbitrary limitation based on the statute of limitations period. If Dr. Haider believed that there is a structural break in pork prices at the start of the Class Period, she should have formulized that hypothesis, controlled for any

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[226] Haider Report, ¶¶22–23.

[227] Even when Dr. Haider presents superficial reasons for making changes to my models, she does not investigate or discuss whether the resulting estimations make any economic or statistical sense. That is, she is solely concerned with how her changes affect the overcharge coefficient. Because many economic variables are related, it is often the case that (due to multicollinearity or other factors) seemingly small changes to a model can lead to large changes in the estimated results. As an example (which I discuss later), Dr. Haider incorporates a change to my models that leads to a lower overcharge coefficient for certain pork products. However, the change also causes the signs on certain other key variables to change in counterintuitive ways. Dr. Haider does not comment on these changes or consider the possibility that her modification is not "improving" the overcharge, but instead leads to a model that is simply unreliable altogether.

[228] *See* Mangum Report, ¶12; Memorandum and Order, Oct. 16, 2020 (Doc. 519).

[229] Dr. Mintert agreed that this focus on the Conspiracy Period starting in 2009 was economically appropriate (Mintert Deposition, pp. 99:21–101:20).

potential confounding factors, and test it appropriately. However, doing so based simply on the statute of limitations period as Dr. Haider has done is economically unsound and methodologically flawed.[230]

a. No Independent Economic Justification for Restricting the Damages Models to the Class Period

133.   In this case, DPPs have alleged a conspiracy to fix, raise, or stabilize the price of pork products in the United States that began at least as early as 2009 and continued until at least June 30, 2018. In order to appropriately assess the impact of the alleged conspiracy, it is necessary to construct an economic model which is consistent with that allegation. In the Mangum Report, I proposed just such a model: an econometric analysis that relies on the behavior of relevant market measures (*i.e.*, price, supply, demand) inside and outside of the Conspiracy Period. While these measures vary over time, the existence of the alleged conspiracy does not; accordingly, a fixed effect (*i.e.*, dummy variable) that spans the length of the Conspiracy Period is suitable and appropriate for measuring the impact of the alleged conspiracy.

134.   In her report, Dr. Haider interrupts the measurement of the impact of the alleged conspiracy by splitting it into two parts based on the Class definition, which is defined by a legal statute of limitations. As such, there is no economic justification for limiting the measured impact to the Class Period, when it has been defined by legal issue, instead of conduct allegations or economic reasoning or evidence. Rather than articulate an economic (or even logical) reason for restricting the damages models to the Class Period, Dr. Haider simply proceeded to do so throughout her report without comment. My direct overcharge models account for the relevant economic factors that impact price; overcharges are then estimated by isolating the impact from the alleged conspiracy. By limiting the overcharge models to the Class Period, Dr. Haider introduces a break that is not based on any factor that impacts prices that her regression model actually controls for (*e.g.*, the non-conspiratorial supply or demand factors or the alleged conspiratorial behavior). Economic literature supports the use of a regression model which

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[230] While she did not include any justification in her report, Dr. Haider attempted to justify her methods in her deposition by pointing to my analysis from *In Re: Packaged Seafood Products Antitrust Litigation*. See Haider Deposition, pp. 278:18–279:4. As I explain further below, Dr. Haider's characterization of my work in that case is simply incorrect.

includes a dummy variable over the entire conduct period to separate it from the benchmark period. For example, Baker and Rubinfeld (1999) explain that the "price effect of the alleged conspiracy is measured by the coefficient on a dummy variable that takes on the value of one during the period (or in the markets) in which the conspiracy is in operation."[231] Similarly, van Dijk and Verboven (2008) write that the "before-and-after approach is usually implemented within a multiple regression framework in which one estimates the price over the entire period (conspiracy and benchmark period) and includes an indictor (or "dummy") variable that is equal to one during the Conspiracy Period and zero otherwise. The estimated coefficient associated with this dummy variable then measures the amount of the price overcharge."[232] If there is an evidence-based, economic, or econometric reason for specifying a model that addresses sub-periods of a given conduct period, Dr. Haider has not presented one. Because her specification has no relationship to any of the facts of this case, she has no ability to interpret her results or determine whether they make statistical or economic sense. Notably, Dr. Haider does not attempt to explain her results—she merely notes that they diverge from my own estimates and moves on.

135.   Dr. Haider claimed that splitting the timeframe of analysis based on the Class Period is "standard" and that I and Dr. Williams both used the same approach in the Packaged Seafood case.[233] First of all, the issue is not restricting the analysis to the Class Period; the issue is restricting the analysis to the Class Period when the Class Period is defined by a legal ruling and not based on market factors or conspiratorial impact (factors that can be controlled for in a regression model). It is unclear exactly what Dr. Haider is referencing in the Packaged Seafood case, but it is the case that 1) an earlier class complaint for Packaged Seafood included a proposed Class Period (July 1, 2004–May 8, 2017)[234] that was longer than the Class Period

[231] Jonathan Baker and Daniel Rubinfeld, "Empirical Methods in Antitrust Litigation: Review and Critique," *American Law and Economics Association* 1, no. 1 (1999): 386–435 at 392.

[232] Theon van Dijk and Frank Verboven, "Quantification of Damages," *Issues in Competition Law and Policy,* vol. 3, ABA Section of Antitrust Law, 2008.

[233] Haider Deposition, pp. 278:14–-280:1.

[234] *In Re: Packaged Seafood Products Antitrust Litigation,* Third Consolidated Direct Purchaser Class Complaint, Case No.: 15-MD-2670 JLS (MDD), Apr. 17, 2018, ¶255.

that was ultimately proposed and certified (June 1, 2011 – July 31, 2015)[235], and that 2) there was a small gap between the start of the alleged conspiratorial behavior (early 2011) and the Class Period. This gap was due to the fact that the alleged wrongdoing involved an agreement on price list increases that were issued but did not go into effect for several weeks. Thus, the Class Period—and my analysis of overcharges—began when the price increases at issue went into effect in the marketplace. In either case, the Class Period and my analysis were based on the effect of the alleged conspiracy, and not on a legal limitation as is the case here. Dr. Haider has provided no economic reason for this split.

b.   *Dr. Haider's Own Testing of My Models Shows Widespread Overcharges for Pork Products During the Class Period*

136.   As shown in Haider Exhibit 12—with no modifications whatsoever—*Dr. Haider's own results show positive, statistically significant overcharges on Shoulders, Ribs, Bacon, Fresh Ham, and Loins during the proposed Class Period.* While Dr. Haider's overcharge estimate for Belly is negative, I note that very few Defendants contributed meaningful quantities of Belly data to the benchmark period to begin with.[236] Thus, it is not surprising to find that further slicing the data into additional subsets leads to different outcomes. However, even if one were to credit Dr. Haider's misguided Belly overcharge estimate, every other pork product shows large and statistically significant overcharges, and thus my ultimate conclusion—that my models can be appropriately applied to estimate overcharges and calculate damages on a class-wide basis—remains intact. Further, while Dr. Haider primarily discusses her results from a model that estimates overcharges separately for different cuts of pork, the version of her model that combines all cuts of pork into a single overcharge also shows a positive and statistically significant overcharge during the proposed Class Period.

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[235] *In Re: Packaged Seafood Products Antitrust Litigation,* Fourth Consolidated Direct Purchaser Class Complaint, Case No.: 15-MD-2670 JLS (MDD), Oct. 5, 2018, ¶180; *In Re: Packaged Seafood Products Antitrust Litigation,* Order Granting Motions for Class Certification, Case No.: 15-MD-2670 JLS (MDD), July 30, 2019, p. 5:14–21 (The order incorrectly specifies the DPP class ending July 1, 2015, instead of July 31, 2015. It is my understanding that this is currently being corrected). More to the point, my analysis in the *Packaged Seafood* matter explicitly assumed that the periods prior to the Class Period were <u>unaffected</u> by the alleged conduct. That is, earlier periods were treated as non-conspiratorial in nature.

[236] See Mangum Report, Figures 66–73.

c. Dr. Haider's Comments on the Lack of Statistical Significance on the USDA Model During the Class Period are Misleading

137.   As a robustness check to my analysis in the Mangum Report, I included the results of a simplified version of my overcharge model that relied on monthly USDA wholesale pricing.[237] Because of the way the USDA data is maintained, this model could not be estimated by pork product category, and did not involve transactional data at all, and was based on a very small observation count. Despite these limitations, as I noted in the Mangum Report, the results of this test were highly consistent with the overcharges I found using my econometric models on Defendants' data.[238] In her report, Dr. Haider criticizes this robustness check because she finds that, when the overcharge model is split into separate Conduct and Class Periods, the estimated overcharge for the Class Period is positive (5.6%) but not statistically significant.[239] I emphasize that my test using the USDA data is exactly that—a test to be compared with my actual econometric models. Regardless, Dr. Haider's finding that the overcharge estimated from wholesale USDA prices is not statistically significant is similarly not surprising.[240] As noted above, the USDA model is based on monthly observations of total pork sold in the United States (as opposed to transactional data). This means that the dataset has significantly fewer observations—it has a few hundred observations instead of hundreds of thousands or millions that are used in the econometric models I rely on for damages purposes. Statistical significance is generally more difficult to determine with small datasets.[241] While I note that Dr. Haider still finds a large, positive overcharge, the fact that her estimates lose statistical significance by imposing additional restrictions on an already-small data set (by slicing the data into even smaller pieces) is neither surprising nor enlightening.

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[237] Mangum Report, ¶249.

[238] Mangum Report, ¶249.

[239] Haider Report, ¶110.

[240] Haider Report, ¶110.

[241] This is because smaller observation counts typically lead to larger variances, which increases the likelihood of finding statistically insignificant results.

2. My Econometric Models Appropriately Distinguish Between Conspiratorial and Non-Conspiratorial Factors

138.   Dr. Haider criticizes my models because she says I am not able to distinguish between price effects resulting from the alleged conspiracy and price effects resulting from other factors.[242] However, a commonly accepted and appropriate way that non-conspiratorial or "lawful" price levels are distinguished from conspiratorial levels is by controlling for supply and demand factors in a well-specified multiple regression analysis of the type that I have performed.[243] The results of my direct overcharge regression models illustrate the portion of price that cannot be explained by supply and demand factors

139.   As I explained in the Mangum Report, my econometric models include a number of appropriate control variables to account for the relevant supply and demand factors, including a) costs associated with raising and slaughtering hogs (as well as hog mortality over time), b) macroeconomic variables such as GDP and inflation (*i.e.*, a consumer price index), c) the prices of substitute products, d) variables to account for seasonal changes in demand for different pork products, e) fixed effects for individual customers to reflect differences in bargaining strength or other customer-specific elements of pricing, and f) variables to account for specific periods of change in pork or general demand, such as the period affected by the swine flu and the onset of the COVID-19 pandemic.[244]

140.   Because these factors are all "non-conspiratorial" in nature, the inclusion of a dummy variable to measure the effect of the alleged conspiracy therefore appropriately isolates them from "conspiratorial" factors. *I note that Dr. Haider does not dispute the relevance of any of these variables.* Rather, she criticizes the implementation of certain variables, argues that certain variables are insufficient, and complains about variables she believes are missing from my models. As set forth below, these criticisms are without merit and do not undermine the reliability or results of my overcharge models.

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[242] Haider Report, Section VI.C.

[243] Jonathan Baker and Daniel Rubinfeld, "Empirical Methods in Antitrust Litigation: Review and Critique," *American Law and Economics Association* 1, no. 1 (1999): 386–435 at 392.

[244] Some variables in a reduced form model will reflect both supply- and demand-side factors. For example, the COVID-19 pandemic affected by production and consumption of pork, and thus a variable measuring effects over that period will necessarily reflect both supply and demand.

a. Dr. Haider's Characterization of Hog "Costs" and Hog "Prices" Is Flawed and Misleading

141.   In the Mangum Report, I explained how my econometric models utilize estimates of the cost of raising hogs—including feed, veterinary care, and other related costs.[245] As I noted in the Mangum Report, the hog cost data I relied on comes from the Iowa State University Extension and is widely referenced by Defendants in their documents.[246] This cost data allows me to control for the fundamental costs of raising hogs, which is important for estimating reliable overcharges in this case.

142.   Dr. Haider criticizes my use of the ISU hog cost data by arguing that such costs would only apply to vertically integrated processors.[247] Thus, Dr. Haider opines that an appropriate regression model would utilize hog "price" data—values that reflect the cost to a processor of *purchasing* a market hog—instead of hog "cost" data for processors that do not grow their own hogs.[248] Dr. Haider then estimates an econometric model that uses a combination of the ISU hog cost and hog price data. Specifically, Dr. Haider's model uses information about the degree of vertical integration for each Defendant to create a "weighted average" hog variable using the hog cost and hog price data.[249] However, Dr. Haider has failed to recognize that the hog "price" data reflects more information than just the costs associated with purchasing hogs.

143.   Demand for market hogs is derived demand—processors are only interested in purchasing hogs because downstream purchasers are interested in buying pork. Accordingly, the price paid for hogs in the marketplace reflects (implicitly) two different elements: 1) the cost the grower incurs to raise the hog, and 2) processors' demand for market hogs, which is itself a reflection of consumers' demand for pork. Thus, by utilizing hog price data, Dr. Haider is effectively incorporating both supply and demand factors into a cost variable in the regression model. That is inappropriate here, for at least two reasons. First, my regression models already

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[245] See Mangum Report, ¶236. I use a separate cost variable to account for costs associated with slaughtering hogs and preparing pork products.

[246] Mangum Report, ¶236 (including footnote 504). I also note that neither Defendant expert disputed the appropriateness or reliability of this data as a measure of the cost of raising hogs.

[247] Haider Report, Section VI.C.1.

[248] *Id*.

[249] See Haider Report, Exhibit 20.

include multiple variables that account for demand. If Dr. Haider desires to incorporate hog price data—and therefore control for demand for pork using that variable alone—then it may be necessary to remove or alter other demand-side variables, such as GDP, substitute prices, and controls for Swine Flu and seasonality. Dr. Haider does not recognize or discuss this issue, and instead just proceeds to modify my models by replacing hog costs with hog prices.

144.   Second, the allegations in this case are that Defendants engaged in a conspiracy to raise pork prices. Because demand for pork is affected by prices for pork, there is a risk of endogeneity by measuring pork demand directly (through the hog price data). In other words, such data may include the effects of the alleged conspiracy, which makes using that data inappropriate. The inclusion of a variable tainted by the alleged conspiracy renders Dr. Haider's "tests" using this data unreliable.

145.   My econometric models include a measure of the fundamental costs associated with hogs, along with other measures of demand. These variables combined appropriately control for the supply and demand factors that affect pork prices, while also remaining unaffected by the alleged conspiracy.

146.   I note, however, that even if Dr. Haider's preferred model (utilizing weighted-averages of hog costs and hog prices based on individual Defendant's degree of vertical integration) is used, *the results still show positive overcharges during the Class Period for all pork products*, and positive overcharges for Bacon, Belly, Ribs, and Shoulders during the overall Conspiracy Period.[250] In other words, taking Dr. Haider's results at face value still shows widespread impact.

b. Dr. Haider's Attempt to Control for "Industry Events In 2008" is Unnecessary, Misleading, and Inappropriately Executed

147.   In her report, Dr. Haider discusses several purported "industry events" during 2008 that she claims are worthy of special treatment.[251] While certain of these factors are related to each other, at a high level, Dr. Haider discusses a) low demand for pork, b) high feed costs, c) excess supply of hogs due to declining mortality resulting from the Circovirus vaccine, and d) the

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[250] See Haider Report, Exhibit 20.
[251] Haider Report, ¶¶126–129.

onset of the Great Recession during 2008 as the bases of her opinion that 2008 was "an anomalous" year.[252] Dr. Haider asserts—incorrectly and wholly without basis—that I failed to account for these factors, and then attempts to rectify the situation by adding a dummy variable over all of the data from 2008.[253] Because the estimated overcharges from her poorly-specified models are lower than those from my own models, she declares the result to be an improvement and moves on without any further explanation or discussion of her results.[254] As I discuss below, virtually every aspect of Dr. Haider's analysis in this section is simply incorrect, and thus her results are meaningless.

148.   My econometric models already appropriately account for each of the "events" or factors that Dr. Haider raises in her report. For example, fluctuations in feed costs—both large and small— are fully accounted for by the cost variables I rely on. Importantly and appropriately, these cost changes are accounted for regardless of the underlying cause—whether it be due to drought conditions, changes in ethanol mandates, or any other factor, the prices of corn, soybean meal, and other feed elements are directly accounted for by my cost variable.

149.   Similarly, Dr. Haider argues that I failed to account for the impact of the Circovirus vaccine that was developed and became available just prior to the start of the Class Period. However, my econometric models contain two variables that fully account for this development (and others) in hog survival rates. First, the ISU hog cost variable includes not only feed and veterinary costs, but also reflects "death loss"—a measure of the financial costs associated with piglets or hogs that die prematurely. Second, I included a variable that directly measures the rate of piglet mortality. These variables adequately and appropriately account for changes in the mortality (and associated costs) from any type of hog-related diseases (or other events) that might impact pork production and therefore, pork prices.

150.   In a footnote, Dr. Haider suggests that my use of the piglet mortality data is insufficient to control for the effects of the Circovirus vaccine.[255] Dr. Haider cites the deposition testimony

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[252] Haider Report, ¶128.

[253] Haider Report, ¶129 and Exhibit 23. This version of Dr. Haider's model estimates positive overcharges during the Class Period for Loins, Ribs, and Shoulders.

[254] Haider Report, ¶129.

[255] Haider Report, ¶127, including footnote 241.

of William Hollis to suggest that "'Circovirus mortality occurs later in the growth period of the pig' and would therefore not be reflected in piglet mortality statistics."[256] In order to test the validity of Dr. Haider's claim, I have re-estimated my econometric models with an additional variable that reflects *finished* hog mortality as well. As shown in Figure 19 below, the results of these updated models are essentially unchanged. I also note that, contrary to the suggestions of Dr. Haider and Dr. Mintert, the finished pig mortality data does not appear to indicate a large change around the time of the Circovirus vaccine's availability.

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[256] Haider Report, footnote 241.

Figure 19. Overcharge Model Results – Including Finished Pig Mortality Data

Explanatory Variables[1]	BACON Est	Se	BELLY Est	Se	FRESH HAM Est	Se	LOIN Est	Se	RIBS Est	Se	SHOULDER Est	Se
Competing Proteins Index					0.50	0.01 *	0.51	0.00 *	0.78	0.01 *	0.37	0.01 *
GDP	0.94	0.02 *	1.67	0.09 *	0.77	0.08 *	0.26	0.02 *	0.54	0.03 *	1.21	0.03 *
ISU Hog Cost	0.11	0.00 *	0.30	0.01 *	0.54	0.01 *	0.48	0.00 *	0.24	0.00 *	0.47	0.00 *
Agri Stats Plant Cost	0.11	0.01 *	0.17	0.02 *	1.21	0.02 *	0.55	0.01 *	0.72	0.01 *	0.65	0.01 *
Swine Flu Indicator	(0.14)	0.00 *	(0.15)	0.00 *	0.02	0.00 *	(0.02)	0.00 *	(0.05)	0.00 *	(0.07)	0.00 *
Consumer Price Index	0.00	0.00 *	(0.00)	0.00	(0.03)	0.00 *	(0.03)	0.00 *	(0.03)	0.00 *	(0.03)	0.00 *
Piglet Loss	1.07	0.01 *	0.85	0.03 *	3.05	0.03 *	1.34	0.01 *	0.51	0.02 *	2.92	0.02 *
Finisher Loss	0.26	0.02 *	(0.72)	0.06 *	0.05	0.05	(1.05)	0.02 *	0.10	0.03 *	(0.52)	0.03 *
January Indicator	-	-	-	-	-	-	-	-	-	-	-	-
February Indicator	0.01	0.00 *	0.01	0.00 *	(0.02)	0.00 *	(0.00)	0.00 *	0.02	0.00 *	(0.05)	0.00 *
March Indicator	0.01	0.00 *	0.01	0.00 *	(0.03)	0.00 *	(0.01)	0.00 *	0.03	0.00 *	(0.03)	0.00 *
April Indicator	0.02	0.00 *	0.01	0.00 *	(0.03)	0.00 *	0.02	0.00 *	0.03	0.00 *	0.00	0.00
May Indicator	0.03	0.00 *	0.04	0.00 *	0.04	0.00 *	0.07	0.00 *	0.06	0.00 *	0.10	0.00 *
June Indicator	0.05	0.00 *	0.09	0.00 *	0.07	0.00 *	0.07	0.00 *	0.04	0.00 *	0.11	0.00 *
July Indicator	0.09	0.00 *	0.14	0.00 *	0.10	0.00 *	0.07	0.00 *	0.00	0.00	0.12	0.00 *
August Indicator	0.12	0.00 *	0.12	0.00 *	0.17	0.00 *	0.09	0.00 *	0.01	0.00 *	0.13	0.00 *
September Indicator	0.08	0.00 *	0.04	0.00 *	0.17	0.00 *	0.08	0.00 *	(0.02)	0.00 *	0.13	0.00 *
October Indicator	0.06	0.00 *	0.05	0.00 *	0.19	0.00 *	0.07	0.00 *	(0.00)	0.00 *	0.12	0.00 *
November Indicator	0.05	0.00 *	0.01	0.00 *	0.18	0.00 *	0.02	0.00 *	0.01	0.00 *	0.09	0.00 *
December Indicator	0.02	0.00 *	(0.02)	0.00 *	0.11	0.00 *	(0.01)	0.00 *	(0.01)	0.00 *	0.06	0.00 *
Jan 2009-Jun 2018 Period Indicator	0.15	0.00 *	0.21	0.01 *	0.05	0.00 *	0.04	0.00 *	0.08	0.00 *	0.12	0.00 *
Jan 2009-Jun 2018 Overcharge Rate[2]	13.9%		19.0%		4.7%		4.1%		8.1%		11.4%	
Jul 2018-Dec 2020 Period Indicator	0.11	0.00 *	0.12	0.01 *	(0.03)	0.00 *	0.01	0.00 *	0.08	0.00 *	0.04	0.00 *
Covid Indicator	0.01	0.00 *	(0.07)	0.01 *	(0.09)	0.01 *	0.15	0.00 *	0.01	0.00 *	0.09	0.00 *
Adjusted R^2	0.88		0.81		0.82		0.93		0.93		0.81	
Number of Observations[3]	1,095,649		130,580		191,479		931,945		572,915		603,865	

Benchmark Period — January 1, 2005 through December 31, 2008
Conspiracy Period — January 1, 2009 through June 30, 2018
Class Period — June 29, 2014 through June 30, 2018

Notes:

Standard errors are calculated by using clusters of Defendant, product code and customer. * denotes statistical significance at $p<0.05$.

[1] Coefficient estimates for the constant and Defendant-product code-customer fixed effects are not reported.

[2] Each Period Overcharge Rate is calculated by the following formula that accounts for the semi-log functional form of the regression model:

$$1 - \frac{1}{exp\,(Period\ Indicator\, -0.5\times Var(Period\ Indicator))}$$

[3] Number of observations reflect unique combinations of Defendant - product code - customer - month values.

151.   Finally, Dr. Haider claims that my models fail to account for the effects of the Great Recession and other demand conditions. This is incorrect, as my models include multiple variables that individually and collectively account for both economy-wide and pork-specific changes in demand: a) GDP, b) the consumer price index, c) prices of competing substitutes, and d) seasonal (monthly) dummy variables. Dr. Haider does not object to any of these variables being included—she simply asserts without any basis that they are insufficient.

(i) Dr. Haider's Solution Regarding the Treatment of 2008 is Poorly Specified and Unscientific, and the Results Are Meaningless

152.   While Dr. Haider's criticisms of my treatment of purported "industry events" are flawed and misguided in their own right, she compounds her own problem with an even more inappropriate solution. Specifically, Dr. Haider places a dummy variable over the entirety of 2008 and re-estimates the regression model.[257] When the results of her model diverge from my own estimates for certain cuts, she declares them to be superior—without any explanation or justification.[258] This is problematic for multiple reasons. First, as I discuss in more detail in the section below, it has the effect of removing an entire year of data from the benchmark period.[259] Second, the "industry events" Dr. Haider describes did not begin on January 1, 2008, nor did they end on December 31, 2008. Rather than undertaking a rigorous study of the "industry events" she purports to control for, Dr. Haider has taken a shortcut that lacks any scientific or econometric basis. While there is no basis for adding additional controls to models that already account for such things, introducing new and arbitrary variables is particularly problematic and renders her results both misleading and meaningless.

(ii) Dr. Haider's Removal of Benchmark Data Weakens the Reliability of Her Econometric Model

153.   As discussed above, Dr. Haider's application of a dummy variable over the calendar year 2008 lacks sound scientific reasoning or justification. It is also problematic from an econometric modeling standpoint, because it effectively removes all data from 2008 from the benchmark period. In order to derive reliable econometric results using a benchmark model, it is important to have sufficient benchmark data. As I explained in the Mangum Report, Defendants' production of transactional data in this case is incomplete, including with respect to the benchmark period.[260] For example, as shown in Figure 20 below, Dr. Haider's approach removes more than half of the benchmark period observations produced by Smithfield—the

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[257] Haider Report, ¶¶126–129 and Exhibit 23.

[258] See Haider Report, ¶129 and Exhibit 23. Dr. Haider's model shows positive overcharges for Loins, Ribs and Shoulder during the Class Period, and Ribs and Shoulders for the larger Conspiracy Period. Dr. Haider does not offer any explanation as to how these results make logical or econometric sense.

[259] As I discuss later, Dr. Haider makes a similarly unscientific and poorly motivated adjustment by treating all of 2008 as "tainted."

[260] See Mangum Report, ¶¶221–225, including Figures 64–73.

largest pork producer in the United States.[261] Similarly, JBS did not produce any data prior to May 2007; thus, by removing 2008 from the benchmark, Dr. Haider's econometric model is forced to rely on data from just seven months in 2007. While Seaboard, Triumph, Tyson, and Hormel produced data for earlier periods, their benchmark period data is significantly curtailed by Dr. Haider's approach.

Figure 20. Mangum Benchmark Observations vs. Haider's Exhibits 23 & 26

	Number of Benchmark Observations		
Defendant	**Mangum Direct Overcharge Model**	**Haider Models in Exhibits 23 and 26**	**Percent Difference**
	[1]	[2]	[3]=[2]/[1] - 1
Clemens	--	--	
Hormel	140,326	104,917	-25%
JBS	54,593	22,621	-59%
Seaboard	106,559	67,392	-37%
Smithfield	8,996	4,144	-54%
Tyson	188,126	137,395	-27%
TOTAL	**498,600**	**336,469**	**-33%**

c. Dr. Haider's "Test" Extending the Conspiracy Period to Include 2008 is Economically Flawed and Poorly Specified

154.   Dr. Haider attempts to use a comment from the Mangum Report as motivation to treat all data from 2008 as part of the Conspiracy Period.[262] Specifically, I noted that USDA production data are consistent with the allegation that Defendants had begun conspiring by early 2009. However, I also noted that the seasonality and production cycles for hogs make it difficult to precisely determine when the alleged conspiracy would start to impact market prices. Therefore, I concluded that if prices were elevated prior to 2009, then my econometric results would be conservative, because my models would be treating some number of elevated prices as untainted benchmark. This is both logical and econometrically correct: if the alleged conspiracy leads to elevated prices, but the model treats them as untainted, the estimated effect

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[261] As shown in Mangum Report, Figure 65, Smithfield's data contributed 4,852 observations for my regression models in 2008, but only 4,144 for 2005–2007 combined.

[262] Haider Report, ¶132 and Exhibit 26.

of the conspiracy will be less accurate. The reverse is also true—if a model treats unimpacted prices as impacted, the estimated effect will be lower. Dr. Haider's attempt to remove 2008 in its entirety from the benchmark and treat it as tainted—is nonsensical. Nothing I said in the Mangum Report on this topic would justify treating any specific part of 2008, much less all of it, as tainted. First, I noted that evidence of declining production *began* in 2008.[263] The USDA data I relied on indicated that domestic *supply* decreased on a year-over-year basis starting in mid-2008; domestic *production* did not decline until the fourth quarter of 2008.[264] Second, contrary to Dr. Haider's insinuation, I did not opine that 2008 was tainted. As explained above, I simply noted that the allegations include actions that could plausibly have started impacting prices prior to early 2009, and that my models were constructed to assume that was not the case.[265] It is unclear how Dr. Haider interpreted this information or my comments as justification for removing 2008 data from the benchmark or attempting to rebut opinions I have not offered.

3. Dr. Haider's Application of Dr. Singer's Piglet Mortality Variable to My Econometric Models is Inappropriate

155.   In my econometric models, I incorporated a variable that reflects the rates of piglet mortality over time. I understand that Dr. Singer and Dr. Williams also used this same variable in their own econometric modeling. While Dr. Haider does not take issue with this data itself, she claims that Dr. Singer and I use it in different ways. Specifically, Dr. Haider takes issue with the fact that Dr. Singer introduces the variable with a 6-month lag, while I introduce it without such a lag. Dr. Haider then replaces the piglet mortality variable in my models with the form used in Dr. Singer's, finds that the overcharge is lower, and declares the results to be an improvement. Both Dr. Haider's methods and her conclusions are wrong.

156.   Dr. Haider's criticism of my piglet mortality variable is contingent on her assumptions that mortality happens only at birth, and that the market is entirely unaware of changes in mortality

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[263] Mangum Report, ¶232.

[264] Mangum Report, Figure 74. The gap between domestic supply and domestic production is a function of exports and imports. As I noted in the Mangum Report, pork exports spiked in early and mid-2008 due to the Olympics in China (Mangum Report, ¶171). Thus, the fact that domestic supplies shrank sooner than domestic production in 2008 is not surprising.

[265] Mangum Report, ¶232.

until many months later. Neither of these assumptions are true. First, while piglet loss specifically associated with PEDv may commonly occur early after birth, piglets can suffer death from disease or other injuries at any point in time prior to reaching market weight. The variable that I used in my models does not track solely deaths of newborn pigs from PEDv—it tracks all mortality.[266]

157.   Second, with respect to PEDv, there is evidence that processors and markets began reacting as soon as they received word of the outbreak. For example, farmers began raising hogs to heavier weights, and "processors and retailers" began "salting away pork" in cold storage facilities to "avoid a potential supply crunch during the spring and summer peak barbecue seasons, especially if production declines as a deadly pig virus sweeps through U.S. farms."[267] Given the ability of market participants to react to information quickly, it is unsurprising that the "amount of pork in U.S. cold storage warehouses" began to soar in early 2014, well ahead of the expected major impact of PEDv: "End users and processors were stocking up on supplies ahead of the expected deficit in production due to the virus."[268] Further, while Dr. Haider's arbitrary and inappropriate application of Dr. Singer's data to my models changes the estimated overcharges, it does not "overturn" the results. *Rather, it shows positive and statistically significant overcharges for all cuts of pork except Fresh Ham (which shows no statistically significant overcharges)*.[269] Thus, even if one were to credit Dr. Haider's arbitrary Fresh Ham overcharge estimate, every other pork product shows positive and statistically

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[266] Dr. Mintert includes a detailed discussion of the effects of various swine diseases on pork supply and demand in his report. My analysis, including the econometric models with which I estimate overcharges, incorporates appropriate controls to account of the impact of such diseases. To the extent that the piglet mortality variable is insufficient in Defendants' experts' opinion, I have also re-estimated my models to include a variable that tracks all hog mortality and found that the results are virtually unchanged.

[267] Theopolis Waters, "U.S. pork stocks again swell to record high as pig virus strikes," Reuters, Mar. 21, 2014, https://www.reuters.com/article/us-usa-pork-storage/u-s-pork-stocks-again-swell-to-record-high-as-pig-virus-strikes-idINBREA2K21A20140321.

[268] Theopolis Waters, "U.S. pork stocks again swell to record high as pig virus strikes," Reuters, Mar. 21, 2014, https://www.reuters.com/article/us-usa-pork-storage/u-s-pork-stocks-again-swell-to-record-high-as-pig-virus-strikes-idINBREA2K21A20140321.

[269] See Haider Report, Exhibit 29. I note that in Dr. Haider's model, the coefficient for GDP in the Fresh Ham model flips signs (it becomes negative), as does the coefficient for the beef-chicken index. Dr. Haider does not comment on these counterintuitive results in her report or provide any explanation in her supporting materials.
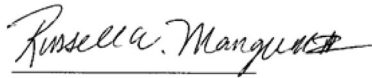
significant overcharges, and thus the end conclusion—that my models can be appropriately applied to estimate overcharges and calculate damages on a class-wide basis—remains intact.

V. CONCLUSION

158.   As set forth in the sections above, nothing in the Mintert or Haider reports undermines or causes me to change any of the opinions I expressed in the Mangum Report. Documents, testimony, and empirical analysis all support a finding of common impact. Further, I have established—and confirmed—that empirical methods are readily available and appropriate for the estimation of overcharges and calculation of damages on a class-wide basis. These methods are set forth in the Mangum Report.[270]

I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct to the best of my knowledge and belief and that this report was executed in Irvine, California, this 17th day of November 2022.
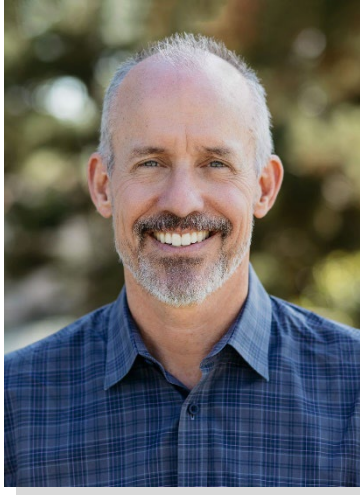
Russell W. Mangum

Russell W. Mangum III

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[270] Mangum Report, Section VI.

CIRQUE ANALYTICS

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CURRENT POSITION

Executive Vice President, Cirque Analytics; 2021–present

EDUCATION

Ph.D., economics, University of Southern California, 1995

M.A., economics, University of Southern California, 1992

B.A., economics (hons), Calif. State University, Fullerton, 1988

SPECIALIZED EXPERIENCE, RESEARCH, OR INTEREST

Antitrust; Commercial Disputes; Intellectual Property; Statistics and Econometrics, Valuation

PAST POSITIONS

2013–2022	Professor, Concordia Univ Irvine, Sch of Bus and Econ (ret.)	Irvine, CA
2021	Visiting Researcher, Univ of Winchester, Sch of Bus, Law, and Tech	Winchester, UK
2007–2021	Sr. Vice President, Nathan Associates, Inc.	Irvine, CA
2002–2012	Associate Adjunct Professor, USC, Dept. of Economics	Los Angeles, CA
2001–2007	Vice President, Analysis Group, Inc.	Los Angeles, CA
2001	Manager, PricewaterhouseCoopers, Financial Advisory Services	Los Angeles, CA
1998–2001	Managing Associate, Nathan Associates Inc.	Arlington, VA
1998–2000	Adjunct Professor, Johns Hopkins University, Krieger School	Washington, DC
1995–1998	Economist, U.S. Federal Trade Commission	Washington, DC

COURSES AUGHT

Principles and Intermediate Economics, Managerial Economics, Statistics and Econometrics, Finance and Financial Markets, Environmental Economics, Bus Inf. Tech., Advanced Topics in Economics

EXPERIENCE SUMMARY

Dr. Mangum has over 25 years of experience in economic analysis, research, and teaching. His consulting practice centers on economic analysis and damages quantification in matters related to intellectual property and technology, antitrust, class certification, statistical analysis, and complex commercial disputes. Dr. Mangum's experience as an economic expert is extensive, with testimony in over 100 matters before local, state, and federal courts. Dr. Mangum has taught graduate and undergraduate courses in economics, statistics, finance, and econometrics. He is currently an Associate Professor of Economics in the School of Business and Economics at Concordia University Irvine, and has previously taught at Johns Hopkins University, The University of Southern California, and Pepperdine University. Dr. Mangum previously worked at Nathan Associates, Inc., PricewaterhouseCoopers, and The United States Federal Trade Commission, Bureau of Economics.

PROFESSIONAL EXPERIENCE

Intellectual Property

Dr. Mangum has substantial experience in the area of intellectual property damages, including claims related to infringement of patents; FRAND licensing commitments; patent pools; copyrights; and trademarks; as well as theft of trade secrets; false designation of origin; and false advertising. The case contexts in which Dr. Mangum has performed these analyses include:

- Patent infringement and disputes related to:
  - Computer, electronics, and telecommunication industry:
    - Cellular communication network technology;
    - Modem communication devices;
    - Wireless communication network devices (routers, cards, including under FRAND licensing commitments);
    - Handheld device navigation applications;
    - NIC hardware and chipsets;
    - Semiconductors;
    - Webswitching and IP router network hardware;
    - Wired and wireless portable electronic temperature sensor devices;
    - Electronic eReader devices;
    - Digital TV Tuners under FRAND licensing commitments;
    - Automated lip-sync animation used in video games;
    - Data encryption devices.
    - VoIP network telephony services.
  - Medical devices:
    - Artificial vertebral disc implants;
    - Trocar seals for laparoscopic surgery;
    - Spinal fusion implants;
    - Breast biopsy devices;
    - Remote medical information monitoring technology;
    - Intraarterial guidewire and embolic filter devices.
  - Energy
    - Specialized valves used in oil refining;
    - Electric utility management systems;
    - Wide-area real time phasor measurement and monitoring.
  - Food and agriculture:
    - Additive-infused confections;
    - Nutritional supplements;

Jackson Hole, WY   Irvine, CA   Los Angeles, CA   Washington, DC

- New variety of late ripening white grapes;
- Structures and methods utilized in the growing of grapes and raisins;
- Cold extraction coffee processes.
- Business software
  - eProcurement;
  - Business intelligence;
  - Design and simulation;
  - Call routing software;
  - Computer tracking;
  - Program and application management;
- Clothing and clothing design
  - Padded athletic shirts/pants; shoes; headwear; accessories;
- Miscellaneous
  - Electronic nicotine delivery systems (NDS)
  - Personal watercraft devices and accessories
  - Consumer advertising design via use of digital media
  - Automated stapling machines used in bed manufacturing
  - Specialized hardware and control systems used in high-rise elevators
  - Electronic exchange systems for trading of commodities futures contracts
  - Electronic data management system used in public transportation projects
  - Document and print inspection systems
- Trademark, trade dress, or copyright infringement related to:
  - IT Network equipment (transceivers and switches);
  - Sponsorship with motorsports, automotive repair tools and devices, beverages and snacks, and apparel;
  - Banking services;
  - Skincare and cosmetics;
  - Real estate property acquisition services;
  - Online dining reservation and payment services;
  - Internet search engine terms related to retail sales of food and arranged food products;
  - Enterprise Resource Planning (ERP) software;
  - Veterinary Teleradiology (online/internet) Services;
  - Devices and software for online mobile device data extraction and IT network devices;
  - Clothing, shoes, and jewelry;
  - Advertising and marketing through wireless mobile communications;

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- Motion picture trademarks in the manufacture of clothing;
- Furniture products (mechanized and non-mechanized);
- Portable combustion engines;
- Infant care products;
- Homeopathic products;
- Postal measuring products;
- Scented candle products;
- Children's toys;
- Art and art exhibits
- Design plans for a theme amusement park.

- Theft of trade secrets related to:
  - Cold extraction coffee processes
  - Electronic mechanisms for payment processing;
  - Technical documents, Product features, customer data, and marketing methods/models related to Systems for General Floor Hospital Monitoring of patient vital statistics;
  - Training methods, pricing models, and customer status databases related to Enterprise Resource Planning (ERP) software;
  - Customer data and information, and pricing models related to employee pension and benefits insurance brokerage services;
  - Government contracted research into laser vibrometry;
  - Devices and software for mobile device data extraction;
  - IT system design and implementation for the US defense industry;
  - Electronic engineering and CAD packages used in US naval warcraft architecture;
  - Methods for mathematical simulations for the pricing of mortgage backed securities;
  - Soy coffee alternative products;
  - Design, development, marketing, and manufacturing of toys;
  - Computer game accessories.

- False advertising, false designation of origin, or unauthorized use of likeness related to:
  - Chemical dependence treatment services;
  - Real estate property acquisition services;
  - Security monitoring systems and services;
  - Consumer appliances;
  - Medical data printer systems;
  - Furniture products;
  - Composed music and lyrics used in television commercials;
  - Restaurant meals and shopping services;

- Internet advertising services via advertorial placement on publishers' websites;
- Nutritional supplements and beverages;
- Orthodontic and Dental devices and services;

Competition/Antitrust

Dr. Mangum has substantial experience in the area of competition and antitrust, including analyses of relevant product and geographic markets, market power, monopolization, and likelihood of monopolization from impending events. These analyses usually include statistical and econometric analysis of market data to identify the extent of competition, and the magnitude of competition. The case contexts in which Dr. Mangum has performed these analyses include:

- Evaluated common impact and estimated damages, for direct and indirect purchasers, from price fixing and other conspiracies in the markets for commercial tissue paper, bulk vitamins, high-end automobiles, ready mix concrete, consumer apparel, Korean noodles, packaged seafood, meat products, interior molded doors, airline travel, and pharmaceuticals.
- Evaluation of alleged competitive foreclosure in the market for sleep apnea products, including relevant markets, market power, and lost profits damages.
- Evaluation of alleged price discrimination across dealers of hardscape building materials.
- Evaluation of antitrust claims and affirmative defenses of patent misuse related to required terms in patent license programs for flash memory semiconductors and systems.
- Evaluation of market segments, market channels, and cost pass-through in the market for DRAM-containing products and NFL brand apparel.
- Estimation of damages related to:
  - A conspiracy to boycott developments in DRAM packaging;
  - Foreclosure of competition in market for footwear insoles and inserts.
- Evaluation of competitive effects of exclusive dealing clause in a franchise agreement.
- Evaluated the competitive effects of exclusive dealing policies regarding:
  - Acute care hospital and physician services;
  - Customer purchase data exchange related to direct mail advertising and sales;
  - Free standing insert advertising (coupon) services;
  - Replacement parts for 3-piece body welder systems;
  - Interconnect agreements between internet backbone communication services;
  - Supply of biological inputs used in creating generic biologic therapeutic treatments;
  - Professional sports branded athletic apparel;
  - Durable medical equipment;
  - Pharmaceuticals.
- Analyzed the competitive effects from wrongful patent application and issuance (fraud on the patent office) related to processes and mechanisms for food preparation and processing.

- Analyzed the likely competitive effects of proposed mergers in various industries, including hospital services, physician services, pharmaceuticals, medical insurance, construction aggregates, supermarkets, auto parts, cable systems and programming, industrial refractories, and computer game software.

Commercial Disputes

- Evaluated damages related to alleged breach of contract involving collection and retention of personalized information connected to web browsing activity.

- Evaluated damages related to alleged breach of contract involving online storage agreements.

- Evaluated claims of damages related to attempted sale of cold extraction coffee company and the discovery of patents allegedly based on confidential information.

- Evaluated claims of damages related to failure to close a sale for multiple solar energy production properties/companies.

- Estimated damages in the form of lost profits from breach of contract in a services joint venture involving use of indexes and associated data for creation and analysis of international financial securitized and derivatives.

- Estimated damages in the form of disgorgement and lost company value related to brokerage services involving employee pension and benefit programs.

- Evaluated claims of replacement cost and lost profits damages related to alleged interference in the market for femtocell wireless communication products.

- Evaluated claims of damages in the form of lost profits and disgorgement of compensation and benefit from alleged unauthorized use of confidential materials in the market for government contracts for research into laser vibrometry.

- Estimated damages from employee theft of HDD computer memory products from s research/testing facility. Calculated value based on historical in-channel market price and on historical costs of manufacturing and sales.

- Evaluated claims of lost profits damages arising from alleged professional malpractice related to commercial development and land use.

- Provided statistical and data analysis of invoices for disaster recovery and construction services. Estimated lost profits related to alleged fraud, breach of contract, and tortious interference.

- Estimated damages related to alleged breaches of contract, including:

  - Contract involving the development and sale of solar power generation projects;

  - Contract involving the supply of active ingredients in nutraceuticals;

  - Non-solicitation agreement between government defense contracting companies;

  - Contract for concession services at amusement parks;

  - Contract for creation and promotion of credit reporting services;

  - Contract for supply of MLB jerseys used in creation of sports memorabilia;

  - Contract for blending and supply contracts for specialized non-dairy beverages;

  - Non-compete clauses (restaurant lease, franchising, structural steel fabrication);

  - Contract for earning and redeeming of frequent flyer miles;

  - Contract for purchase of television airtime on a local over-the-air station;

- Contract for representation and sale of television programming;
- Royalty contract regarding design and functionality elements use in toys;
- Contract for technology and support from software conference bridge systems;
- Contract for conference calling services and long distance calls connection services.

- Estimated damages from defamation related to the launch of a clinic for medical disorders.

- Evaluated claims by the CA Coastal Commission related to lost recreational value from proposed coastal bluff seawall construction.

- Evaluated concepts and methods for calculating proceeds from a Qi Tam suit related to improper medical lab billing practices.

- Estimated damages related to Quantum Meruit claims involving use of software to manage viewing and storage of electronic medical images.

Employment and Labor

- Estimated damages related to lost profits; lost company value, employee training and hiring expense, and/or disgorgement of defendant's profits in multiple cases related to the alleged breach of non-solicitation agreements and unauthorized use of confidential information by departing employees the insurance and MLM health and wellness industries.

- Estimated lost profits damages and/or disgorgement of defendant's profits in multiple cases related to the alleged breach of non-solicitation agreements and unauthorized use of confidential information involving government defense contracting companies.

- Estimated plaintiff's lost profits and disgorgement of defendant's profits related to the theft of trade secrets by departing employees in the automated emergency/disaster response industry.

- Estimated disgorgement of defendant's profits related to the theft of trade secrets by departing employees in the naval engineering industry.

- Provided statistical analysis of employee time card and pay data to estimate instances of underpayment or missed breaks.

- Estimated lost earnings and compensation damages related to an alleged wrongful termination of an employee; evaluated lost wages/earnings, lost retirement benefits, and lost compensation through stock options.

- Estimated damages to an employee/inventor related to exclusion as an inventor from PCT applications following termination from a start-up medical devices company; evaluated the plaintiff's claims of lost share of proceeds from technology share.

Statistical and Econometric Analysis

- Performed regression analysis to evaluate class-wide damages related to class certification in the context of alleged conspiracy on the prices of interior molded doors.

- Performed regression analysis to evaluate class-wide damages related to class certification in the context of alleged conspiracy on the prices of packaged seafood.

- Performed regression analysis to evaluate class-wide damages related to class certification in the context of alleged conspiracy on the prices of transatlantic air travel.

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- Performed regression analysis to evaluate class-wide damages related to class certification in the context of alleged conspiracy on the prices of Korean noodle products.

- Evaluated regression and statistical analysis offered in support of damages related to an alleged breach of non-solicitation agreements and unauthorized use of confidential information by departing employees the insurance and MLM health and wellness industries.

- Evaluated regression and statistical analysis offered in support of damages and common impact in an indirect purchaser class action related to alleged false advertising for nutritional supplement beverages.

- Performed regression analysis to evaluate class-wide damages related to class certification in the context of alleged conspiracy and exclusive agreement between professional sports teams and an apparel manufacture.

- Performed regression analysis to estimate class-wide damages related to class certification in the context of alleged price fixing in markets for ready mix concrete.

- Performed regression analysis to estimate pass-through of anticompetitive price increases in the manufacturing and sale of DRAM and DRAM containing devices.

- Provided statistical analysis of employee time card and pay data to estimate instances of underpayment or missed breaks.

- Provided sampling techniques and statistical analysis of customer service database to estimate the extent of use of an allegedly infringing feature in a commercial router.

- Evaluated sampling techniques and extrapolation estimates related to allegedly improper medical billing practices and in the context of damages related to construction defects.

- Provided statistical and econometric analysis of survivorship related to consumer membership attrition in credit reporting programs.

- Provided statistical and econometric analysis of the correlation between purchase of infringing products and consequential purchase of related services.

- Provided statistical analysis and estimate of medical product sales in the absence of data from third party sales force.

- Provided statistical and econometric analysis of conference calling minutes related to alleged intentional interference and unfair competition.

- Conducted statistical analysis of incremental costs in support of lost profits calculations.

EXPERT WITNESS EXPERIENCE (SINCE 2017)

- *MGA Entertainment Inc. v. Clifford "T.I." Harris, et al.,* United States District Court, Central District of California, Western Division (2022). Submitted an expert report (initial and supplemental) on behalf of counter-defendant related to misappropriation of intellectual property (name, likeness, trade dress) related to the promotion and sale of certain doll products.

- *In Re Broiler Chicken Antitrust Litigation,* United States District Court, Northern District of Illinois (2022). Testified at a bench trial (evidentiary hearing), and in depositions (3) on behalf of plaintiff class related to the economic effects of an alleged conspiracy to constrain capacity and increase prices in the broiler chicken industry.

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• *Dr. Joseph Ciccio, et al., v. SmileDirect Club Inc., et al.,* United States District Court, Middle District of Tennessee, Nashville Division, (2022). Provided deposition testimony on behalf of plaintiff class involving damages related to allegations of false statements regarding orthodontic and dental treatment.

• *In Re Pork Antitrust Litigation,* United States District Court, Northern District of Minnesota (2022). Provided deposition testimony on behalf of plaintiff class related to the economic effects of an alleged conspiracy to constrain capacity and increase prices in the pork industry.

• *Lauren Adele Oliver v. Meow Wolf Inc., et al.,* United States District Court for the District of New Mexico (2022). Provided deposition testimony on behalf of plaintiff involving damages related to alleged copyright infringement involving art and art exhibits.

• *Sprint Communications Company LP v. Cequel Communications, LLC, et al.,* United States District Court, District of Delaware (2022). Testified at a bench trial (evidentiary hearing), and in deposition on behalf of plaintiff related to lost profits and royalty damages from alleged patent infringement involving VoIP telephony network services.

• *VRtoysone, LLC, et al v. Disney Interactive Studios, Inc.,* United States District Court, Central District of California, Western Division (2022). Submitted an expert report on behalf of Defendant involving damages related to alleged patent infringement involving video games.

• *Patrick Calhoun, et al. v. Google LLC,* United States District Court, Northern District of California (2021). Provided depositions (2) testimony on behalf of plaintiff class involving damages and common impact related to alleged breach of contract involving the collection and retention of personalized information connected to web browsing activity.

• *CPI Security Systems Inc. v. Vivint Smart Home Inc. et al.,* United States District Court, Western District of North Carolina, Charlotte Division (2021). Provided deposition testimony on behalf of plaintiff involving unjust enrichment and royalty damages related to alleged false advertising and unfair competition related to security monitoring systems and services.

• *Martifer-Silverado Fund I, LLC and Silverado Power LLC v. Talesun Solar USA, Ltd.,* Superior Court of California, San Francisco County (2021). Provided trial and deposition testimony on behalf of Defendant, related to alleged breach of contract involving solar energy projects.

• *Javo Beverage Co., Inc., v. Stephen Corey,* American Arbitration Association (2021). Provided trial (arbitration) and deposition testimony on behalf of respondent related to breach of contract and misappropriation of confidential information and technology in the market for coffee extracts.

• *Andrea Williams and James Stewart (class reps) v. Apple Inc.,* United States District Court, Northern District of California (2021). Submitted an expert report on behalf of plaintiffs related to damages involving alleged breach of contract regarding provision of electronic file storage.

• *QC Manufacturing, Inc., v. Solatube International, Inc. and Brighter Concepts, Inc. dba Solatube Home Daylight,* JAMS Arbitration, Los Angeles, CA (2020). Provided trial (arbitration) testimony on behalf of complainant related to a breach of contract (litigation settlement agreement) involving whole house fans.

• *In Re Domestic Airline Travel Antitrust Litigation,* United States District Court, District of Columbia (2020). Provided deposition testimony on behalf of plaintiff class related to the economic effects of an alleged conspiracy to constrain capacity in the domestic airline travel industry.

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- *RV Skincare Brands LLC v. Digby investments Ltd.., Quickbox LLC, et al.,* United States District Court, Southern District of New York (2020). Submitted an expert report on behalf of certain defendant related to damages from alleged counterfeit sales and trademark infringement involving fulfillment of skincare product commerce.

- *Cisco Systems Inc. et al. v. Zahid Hassan Sheikh et al.,* United States District Court, Northern District of California (2020). Provided deposition testimony on behalf of certain defendants related to damages from alleged counterfeit sales and trademark infringement involving transceiver and switching IT network equipment.

- *San Diego Country Credit Union v. Citizens Equity First Credit Union,* United States District Court, Southern District of California (2020). Provided deposition testimony on behalf of plaintiff related to damages flowing from fraudulent declaration in the registration of a trademark involving credit unions.

- *Sprint Communications Company LP v. Atlantic Broadband Finance LLC, et al.,* United States District Court, District of Delaware (2020). Provided deposition testimony on behalf of plaintiff related to lost profits royalty damages from alleged patent infringement involving VoIP telephony network services.

- *Sprint Communications Company LP v. Charter Communications Inc. et al.,* United States District Court, District of Delaware (2020). Provided deposition testimony on behalf of plaintiff related to lost profits and royalty damages from alleged patent infringement involving VoIP telephony network services.

- *Sprint Communications Company LP v. Mediacom Communications Corp.,* United States District Court, District of Delaware (2020). Provided deposition testimony on behalf of plaintiff related to lost profits and royalty damages from alleged patent infringement involving VoIP telephony network services.

- *Sprint Communications Company LP v. TPC Global LLC et al.,* United States District Court, District of Delaware (2020). Provided deposition testimony on behalf of plaintiff related to lost profits and royalty damages from alleged patent infringement involving VoIP telephony network services.

- *Sprint Communications Company LP v. Wideopenwest Inc. et al.,* United States District Court, District of Delaware (2020). Provided deposition testimony on behalf of plaintiff related to lost profits and royalty damages from alleged patent infringement involving VoIP telephony network services.

- *S&P Dow Jones Indices LLC and SPDJ Singapore Pte Ltd. v. BSE Ltd.,* United States District Court, Northern District of California (2020). Provided trial (tribunal) testimony on behalf of claimants and counterrespondants for an arbitration concerning damages from breach of contract in a service joint venture related to the use of indexes and associated data for creation and analysis of international financial securitized and derivatives.

- *In Re: Molded Doors Indirect Purchaser Antitrust Litigation,* United States District Court, Eastern District of Virginia, Richmond Division (2020). Provided deposition testimony related to class certification and the merits phase of an antitrust case on behalf of an indirect purchaser plaintiff class related to the evaluation of common impact, pass-through, and class wide damages involving alleged collusion on the prices for interior molded doors.

- *Citcon USA LLC v. Riverpay Inc. et al.,* United States District Court, Northern District of California (2019). Provided trial and deposition testimony on behalf of defendant/counterplaintiff concerning damages from alleged tortious interference and breach of contract involving electronic payment processing network services.

- *3G Licensing, et al., v. Lenovo Group Ltd., et al.,* United States District Court, District of Delaware (2019). Submitted an expert report on behalf of defendants Lenovo and Motorola Mobility related to reasonable royalty damages for patent infringement involving cellular phone network technologies.

- *Inteliquent, Inc. v. Free Conferencing Corporation, et al.,* United States District Court, Northern District of Illinois, Eastern Division (2019). Provided deposition testimony on behalf of Counterclaim Plaintiffs, related to alleged breach of contract, intentional interference, and unfair competition involving conference calling services and long-distance calls connection network services.

- *In Re: Packaged Seafood Products Litigation,* United States District Court, Southern District of California (2019). Provided testimony in depositions (3) and testified at trial (evidentiary hearing) on behalf of direct purchaser plaintiff class related to class certification and estimation of class wide damages in an antitrust case involving alleged collusion on the prices for packaged seafood.

- *T.R.P. Company, Inc., v. Similasan AG and Similasan Corporation,* United States District Court, District of Nevada (2019). Provided deposition testimony on behalf of plaintiff/counter-defendant involving unjust enrichment and lost profits related to trademark infringement of certain homeopathic products.

- *Advanced Digital Solutions International, Inc., v. Rahi Systems, Inc., et al.,* Superior Court for the State of California, County of Alameda (2019). Provided deposition testimony on behalf of plaintiff concerning disgorgement damages related to trade secret misappropriation involving the theft of customer lists.

- *ADT LLC and ADT* US *Holdings v. Alder Holdings LLC, et al.,* United States District Court, Southern District of Florida, Palm Beach Division (2019). Provided trial and deposition testimony on behalf of plaintiff involving unjust enrichment and royalty damages related to alleged false advertising and unfair competition, and contempt of injunction related to security monitoring systems and services.

- *ADT LLC v. Security Networks LLC et al.,* United States District Court, Southern District of Florida, Palm Beach Division (2019). Submitted an expert report on behalf of plaintiff involving unjust enrichment and royalty damages related to alleged false advertising and unfair competition, and contempt of injunction related to security monitoring systems and services.

- *ADT LLC & ADT US Holdings, Inc. v. Northstart Alarm Services LLC et al.,* United States District Court, Southern District of Florida (2019). Submitted an expert report on behalf of plaintiff involving unjust enrichment and royalty damages related to alleged false advertising and unfair competition, and contempt of injunction related to security monitoring systems and services.

- *Grasshopper House LLC. V. Clean & Sober Medua LLC., et al.*, and *Cliffside Malibu, et al. v. Grasshopper House LLC, et al.* United States District Court, Central District of California, Western Division (2019). Provided trial and deposition testimony on behalf of counterclaim plaintiffs involving damages from alleged false advertising related to treatment services for chemical dependence.

- *In Re Korean Ramen Antitrust Litigation,* United States District Court, Northern District of California, San Francisco Division (2018). Provided trial and deposition testimony on behalf of a class of purchasers of Korean Noodles related to damages from an alleged antitrust price fixing conspiracy.

- *Monster Energy Company v. Integradted Supply Network LLC,* United States District Court, Central District of California (2018). Provided trial testimony on behalf of plaintiff related to damages from alleged trademark and trade dress infringement involving beverages and snacks, tools, and clothing, motorsports and sponsorship and promotion.

- *Soteria Encryption LLC v. Apricorn Inc., et al.,* United States District Court, Central District of California, Western Division (2018). Submitted an expert report on behalf of defendants Apricorn and Lenovo related to reasonable royalty damages for patent infringement involving data encryption network devices.

- *McRO Inc. v. Bandai Nameco Games America Inc., et al.,* United States District Court, Central District of California, Western Division (2018). Provided deposition testimony on behalf of certain defendants related to damages from alleged patent infringement involving automated lip-sync animation used in video games.

- *In Re: Transpacific Passenger Air Transportation Antitrust Litigation,* United States District Court, Northern District of California San Francisco Division (2018). Provided deposition testimony on behalf of direct purchaser plaintiff class related to class certification and estimation of class wide damages in an antitrust case involving alleged collusion on the prices for transatlantic air travel.

- *Express Homebuyers USA, LLC, v. WBH Marketing Inc.,* United States District Court, Eastern District of Virginia, Alexandria Division (2018). Provided deposition testimony on behalf of defendant/counterplaintiff related to damages from alleged trademark infringement and trade libel involving real estate property acquisition services.

RESEARCH PAPERS AND PUBLICATIONS

- "FRAND Commitments and Royalties for Standard Essential Patents", with S. Bosworth and E. Matolo, in Complications and Quandaries in the ICT Sector, Bharadwaj, Gupta, and Devaiah eds., Ch. 2, Springer Open, ISBN 978-981-10-449570, 2018.

- "Corrective Advertising in Lanham Act Damages: The Use and Misuse of Past Advertising Expenditures" with S. Bosworth and E. Matolo, *The Trademark Reporter*, May-June Volume, 2017.

- "The Case for Admitting Settlement License Agreements in a Reasonable Royalty Analysis," with S. Conroy and R. Knudsen, 2011, *Les Nouvelles,* Volume XLVI No. 4, 2012.

- "Cost Analysis," with J. Kinrich and A. Meister, in Intellectual Property Damages, Guidelines and Analysis, 2004 supplement, M. Glick, L. Reymann, and R. Hoffman, eds., Chapter 14a, Wiley: New York.

- "Analysis and Measurement of Damages in Patent Infringement Actions," with J. Kinrich, 2003, proceedings of Practicing Law Institute.

PAST OR PRESENT AWARDS, PROFESSIONAL MEMBERSHIPS

Outstanding Antitrust Litigation Achievement in Economics, American Antitrust Institute, 2019

American Antitrust Institute, advisory board member

American Bar Association, member

American Economic Association, member

Licensing Executives Society, member, chapter chair

Los Angeles County Bar Association, member

Los Angeles Intellectual Property Law Association, member

Orange County Bar Association, member

Orange County Patent Law Association, member

Appendix B: Materials Relied Upon

Legal Materials

- Direct Purchaser Plaintiffs' Third Amended and Consolidated Class Action Complaint, Jan. 15, 2020
- Memorandum and Order, Oct. 16, 2020 (Doc. 519)

Depositions and Exhibits

- Deposition of David Delaney, Apr. 20, 2022
- Deposition of Dr. James Mintert, Nov. 9, 2022
- Deposition of Dr. Laila Haider, Nov. 3, 2022
- Deposition of James Fiala, Mar. 30, 2022
- Deposition of Mark Bricker, Aug. 29, 2022
- Deposition of Paul Peil, Dec. 9, 2021
- Deposition of Russell W. Mangum, Ph.D., July 13, 2022
- Deposition of Steve Meyer, Apr. 26, 2022
- Deposition of Terry Holton, Sept. 8, 2022

Expert Reports and Related Productions

- Corrected Expert Report of Michael A. Williams, Ph.D., July 29, 2022
- Declaration of Hal J. Singer, Ph.D., in Support of Consumer Indirect Purchaser Plaintiffs' Motion for Class Certification, May 2, 2022
- Expert Report of Dr. Laila Haider, Aug. 24, 2022
- Expert Report of James Mintert, Ph.D., Aug. 24, 2022
- Expert Report of Russell W. Mangum, Ph.D., May 2, 2022

Publicly Available

- Anne Krema and Emily Balsamo, "Seasonality in Hogs vs Pork: More Than Just Grilling Season," Open Markets, Sept. 27, 2022, https://www.cmegroup.com/openmarkets/agriculture/2022/Seasonality-in-Hogs-vs-Pork-More-Than-Just-Grilling-Season.html
- Bryan Salvage, "Made to Order," Meat + Poultry, Dec. 1, 2009, https://www.meatpoultry.com/articles/1498-made-to-order
- Damodar Gujarati, *Basic Econometrics,* 4th ed. (New York, NY: McGraw Hill, 2003)
- Dennis Carlton and Jeffrey Perloff, *Modern Industrial Organization,* 4th ed. (Chicago, IL: Addison Wesley, 2005)
- *In Re: Packaged Seafood Products Antitrust Litigation,* Fourth Consolidated Direct Purchaser Class Complaint, Case No.: 15-MD-2670 JLS (MDD), Oct. 5, 2018
- *In Re: Packaged Seafood Products Antitrust Litigation,* Order Granting Motions for Class Certification, Case No.: 15-MD-2670 JLS (MDD), July 30, 2019
- *In Re: Packaged Seafood Products Antitrust Litigation,* Third Consolidated Direct Purchaser Class Complaint, Case No.: 15-MD-2670 JLS (MDD), Apr. 17, 2018
- J. Deyoung, "Pork packing capacity faces delays to growth," *Iowa Farmer Today,* June 15, 2018, https://www.agupdate.com/iowafarmertoday/news/livestock/pork-packing-capacity-faces-delays-to-growth/article_f86fde7e-64dc-11e8-b288-475ac8083072.html
- Jonathan Baker and Daniel Rubinfeld, "Empirical Methods in Antitrust Litigation: Review and Critique," *American Law and Economics Association* 1, no. 1 (1999): 386–435
- Michelle M. Burtis and Darwin V. Neher, "Correlation and Regression Analysis in Antitrust Class Certification," *Antitrust Law Journal* 77, no. 2 (2011): 495–532

Appendix B: Materials Relied Upon

- National Hog Farmer, "Spot Marketing Hog Sales Slip in January," Mar. 11, 2008, *available at* https://www.nationalhogfarmer.com/marketing/news/0311-marketing-hog-sales-slip
- *New York Times,* "Why Russian Oil and Gas Matter to the Global Economy," Mar. 10, 2022, *available at* https://www.nytimes.com/explain/2022/03/09/business/gas-oil-russia-ukraine
- Niche Meat Processing, "Sioux-Preme Packing Company," accessed Nov. 10, 2022, https://www.nichemeatprocessing.org/sioux-preme-packing-company
- Pork Checkoff, "Estimated Daily U.S. Slaughter Capacity by Plant (head per day)," Aug. 9, 2017, *available at* https://www.porkcdn.com/sites/porkorg/library/2015/12/estimated_daily_u.s._slaughter_capacity_by_plant_hpd.pdf
- Pork Checkoff, "Estimated Daily U.S. Slaughter Capacity by Plant (head per day)," Sept. 17, 2018
- Pork Checkoff, "Pork Stats 2014," Nov. 21, 2014, *available at* https://texas4-h.tamu.edu/wp-content/uploads/Pork-Facts.pdf
- Pork Checkoff, "Quick Facts: The Pork Industry at a Glance," *available at* https://porkgateway.org/wp-content/uploads/2015/07/quick-facts-book1.pdf
- Robert S. Pindyck and Daniel L. Rubinfeld, *Microeconomics,* 9th (Global) ed. (Essex, England: Pearson Education Limited, 2018)
- Sanjib Bhuyan, "Does Vertical Integration Effect Market Power? Evidence from U.S. Food Manufacturing Industries," *Journal of Agricultural and Applied Economics* 37, no. 1 (Apr. 2005): 263–276
- Sharon Spielman, "How Prestage Foods of Iowa Built a State-of-the-Art Pork Processing Plant," *Food Engineering,* Dec. 9, 2019, https://www.foodengineeringmag.com/articles/98612-prestage-farms-built-a-state-of-the-art-pork-processing-plant-in-northwest-iowa
- Steve R. Meyer and Barry Goodwin, "Structure and Importance of the U.S. Pork Industry," *available at* https://nppc.org/wp-content/uploads/2021/06/Competition_Paper_FINALWD.pdf
- Swine, "Marketing Slaughter Hogs Under Contract," Aug. 29, 2019, https://swine.extension.org/marketing-slaughter-hogs-under-contract/
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- Timothy Wise and Sarah Trist, "Buyer Power in U.S. Hog Markets: A Critical Review of the Literature," Global Development and Environment Institute, Working Paper No. 10-04, Aug. 2010, https://ageconsearch.umn.edu/record/179085
- USDA, "A User's Guide to USDA's LMR Pork Reports," *available at* https://www.ams.usda.gov/sites/default/files/media/LMRPorkPriceReportsHandout.pdf
- USDA, "FAQ's - The Swine Contract Library," accessed Nov. 10, 2022, https://www.ams.usda.gov/rules-regulations/packers-and-stockyards-act/regulated-entities/swine-contract-library-faq
- USDA, "Livestock and Meat Domestic Data: All supply and disappearance: Historical," *available at* https://ers.usda.gov/data-products/livestock-and-meat-domestic-data/
- USDA, "National Daily Hog and Pork Summary," Nov. 7, 2022, *available at* https://mymarketnews.ams.usda.gov/viewReport/2872

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- USDA, "Swine Contract Library Information," accessed Nov. 10, 2022, https://www.ams.usda.gov/rules-regulations/packers-and-stockyards-act/regulated-entities/swine-contract-library
- USITC DataWeb, *available at* https://dataweb.usitc.gov/trade/search/TotExp/SITC

Other Materials

- All materials cited in Expert Report of Russell W. Mangum, Ph.D., May 2, 2022, including its Appendix B

Bates Documents on following page

Appendix B: Materials Relied Upon

|	
AGSTAT-P-0003392076	TF-P-000800928
CLMNS-0000643212	TF-P-001563315
CLMNS-0000704908	TF-P-001605595
HFC-PORKAT0000045153	TF-P-001635110
HFC-PORKAT0000046909	TF-P-002253012
HFC-PORKAT0000047054	TF-P-002388035
HFC-PORKAT0000047101	TRI0000262043
HFC-PORKAT0000047424	TRI0000262075
HFC-PORKAT0000131245	TRI0000387004
JBS-PORK-00220320	
JBS-PORK-00220947	
JBS-PORK-00309581	
JBS-PORK-00880535	
JBS-PORK-01093548	
PFI00001270	
PFI00005570	
PFI00005632	
Rabo_0000363133	
Rabo_0000373809	
SBF0068377	
SBF0224522	
SBF0258716	
SBF0617731	
SBF0667969	
SMITHFIELD00872455	
SMITHFIELD04092493	
SMITHFIELD04126297	
SMITHFIELD04391680	
SMITHFIELD04771010	
TF-P-000014545	
TF-P-000076737	
TF-P-000494885	

APPENDIX C

Appendix C - 1
Modified Dr. Haider's Price Response Analysis

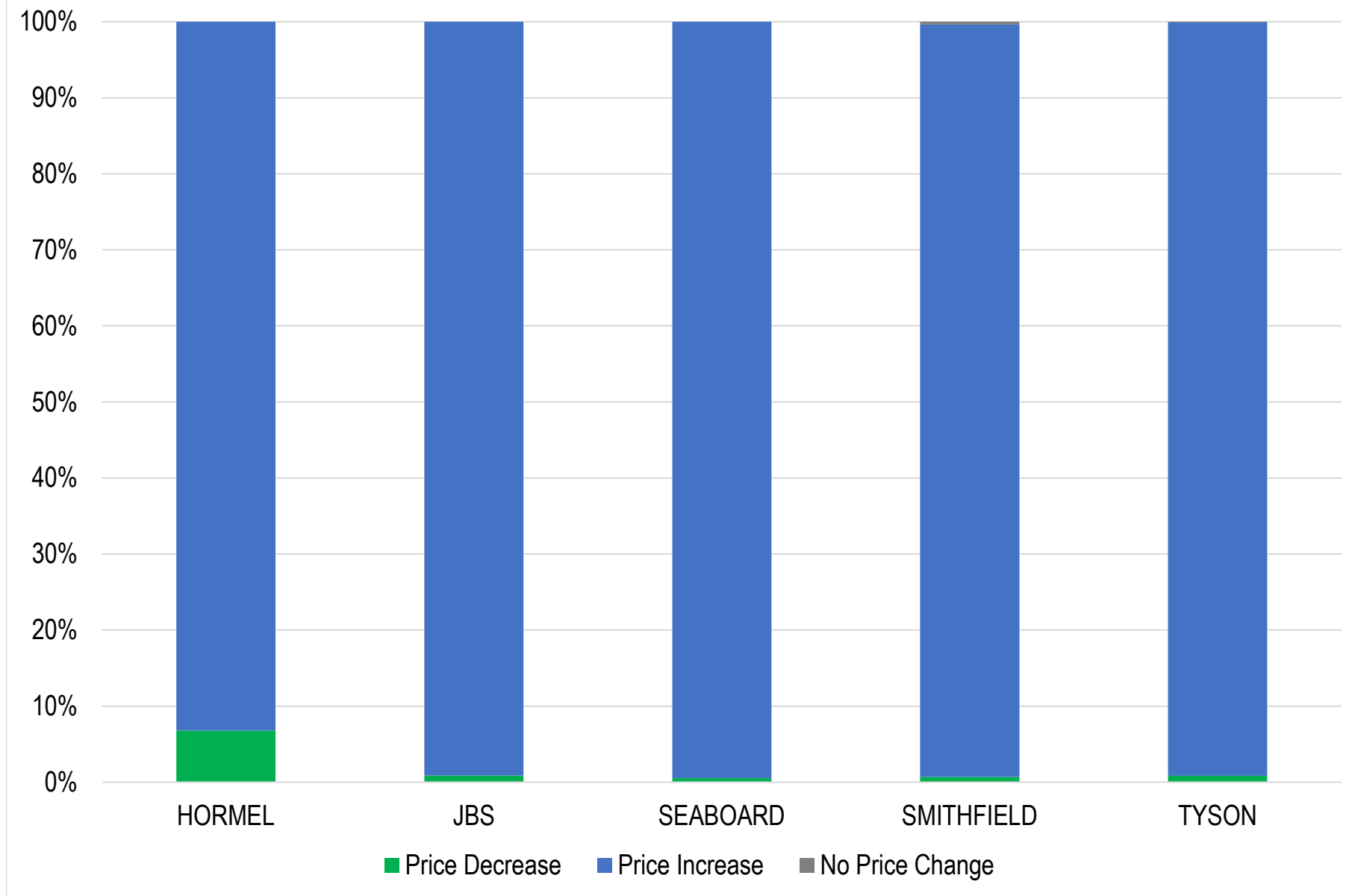Effects of the Alleged Conspiracy on Fresh Ham Products Starting in January 2010, +/- 6 months
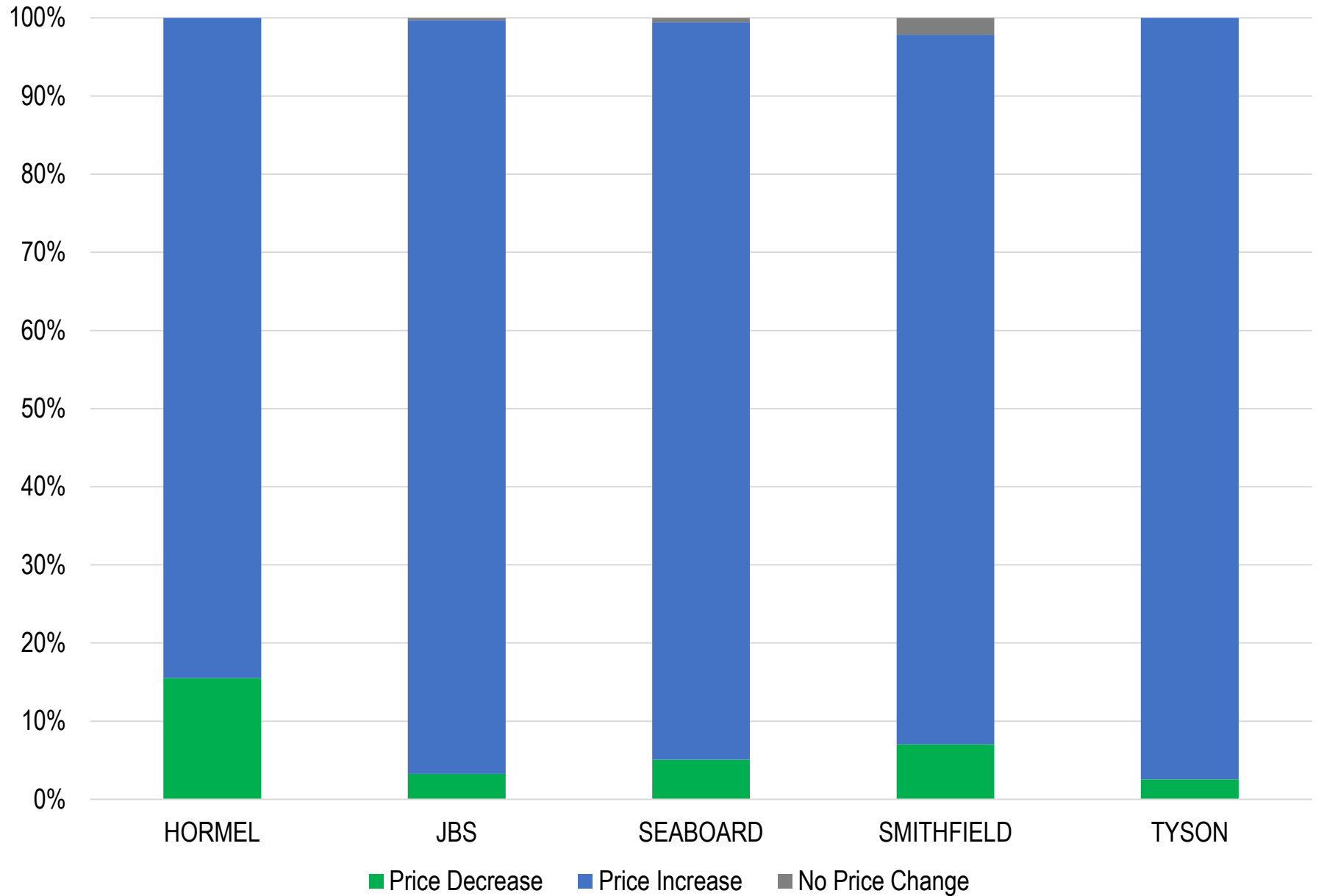
Appendix C - 2
Modified Dr. Haider's Price Response Analysis

**Effects of the Alleged Conspiracy on Loin Products Starting in January 2010, +/- 6 months**
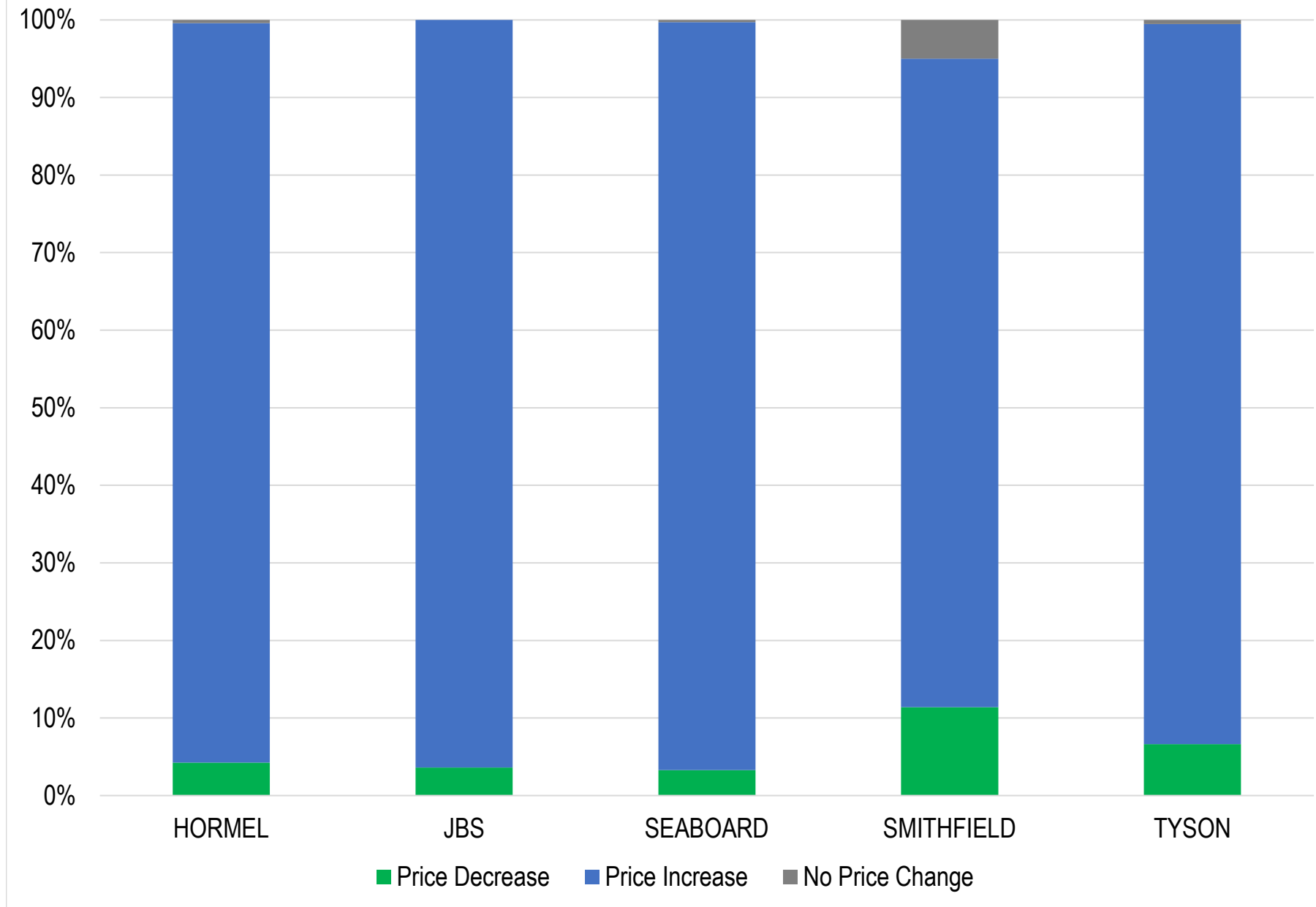
Appendix C - 3
Modified Dr. Haider's Price Response Analysis

Effects of the Alleged Conspiracy on Shoulder Products Starting in January 2010, +/- 6 months
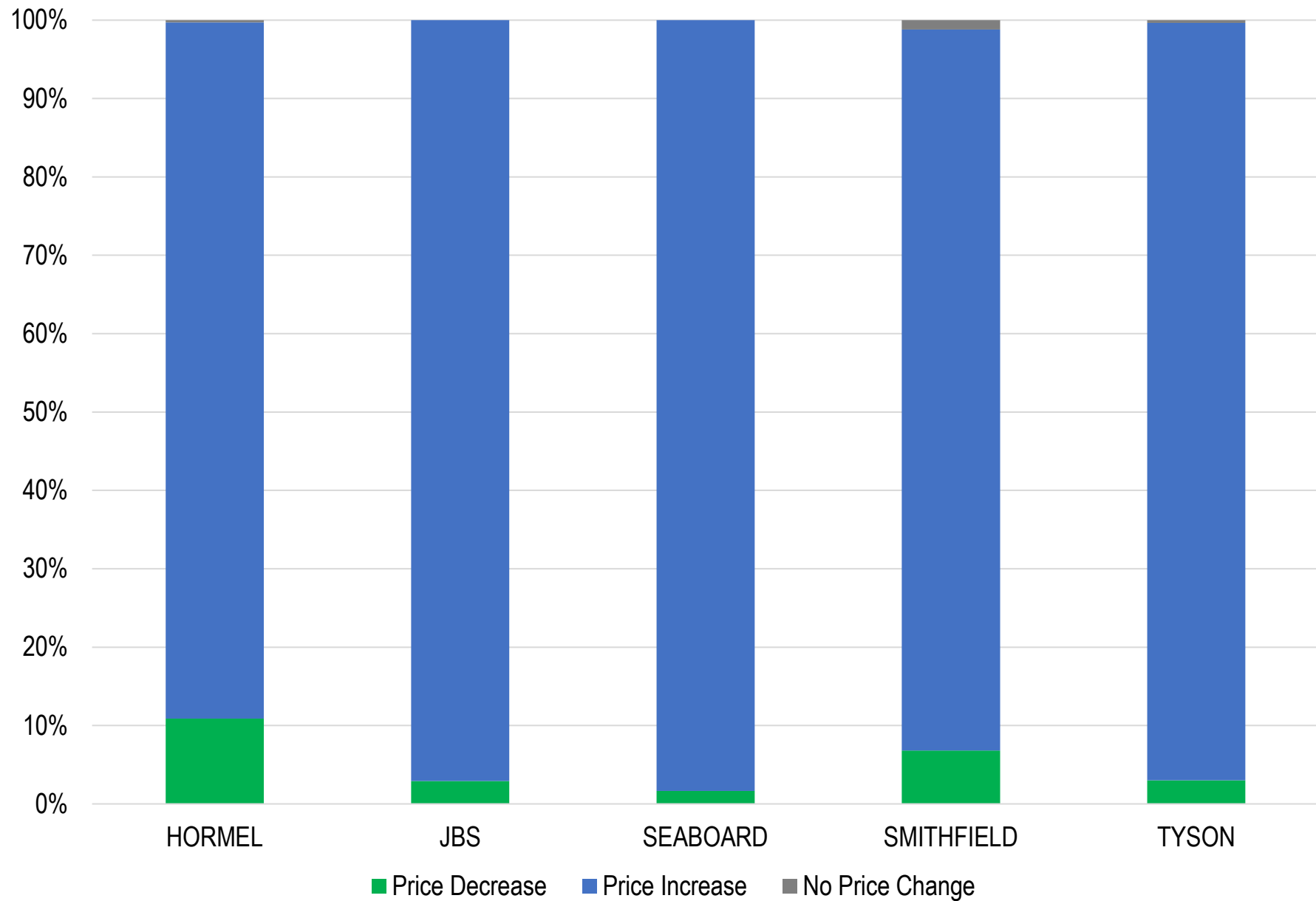
Appendix C - 4
**Modified Dr. Haider's Price Response Analysis**

Effects of the Alleged Conspiracy on Ribs Products Starting in January 2010, +/- 6 months
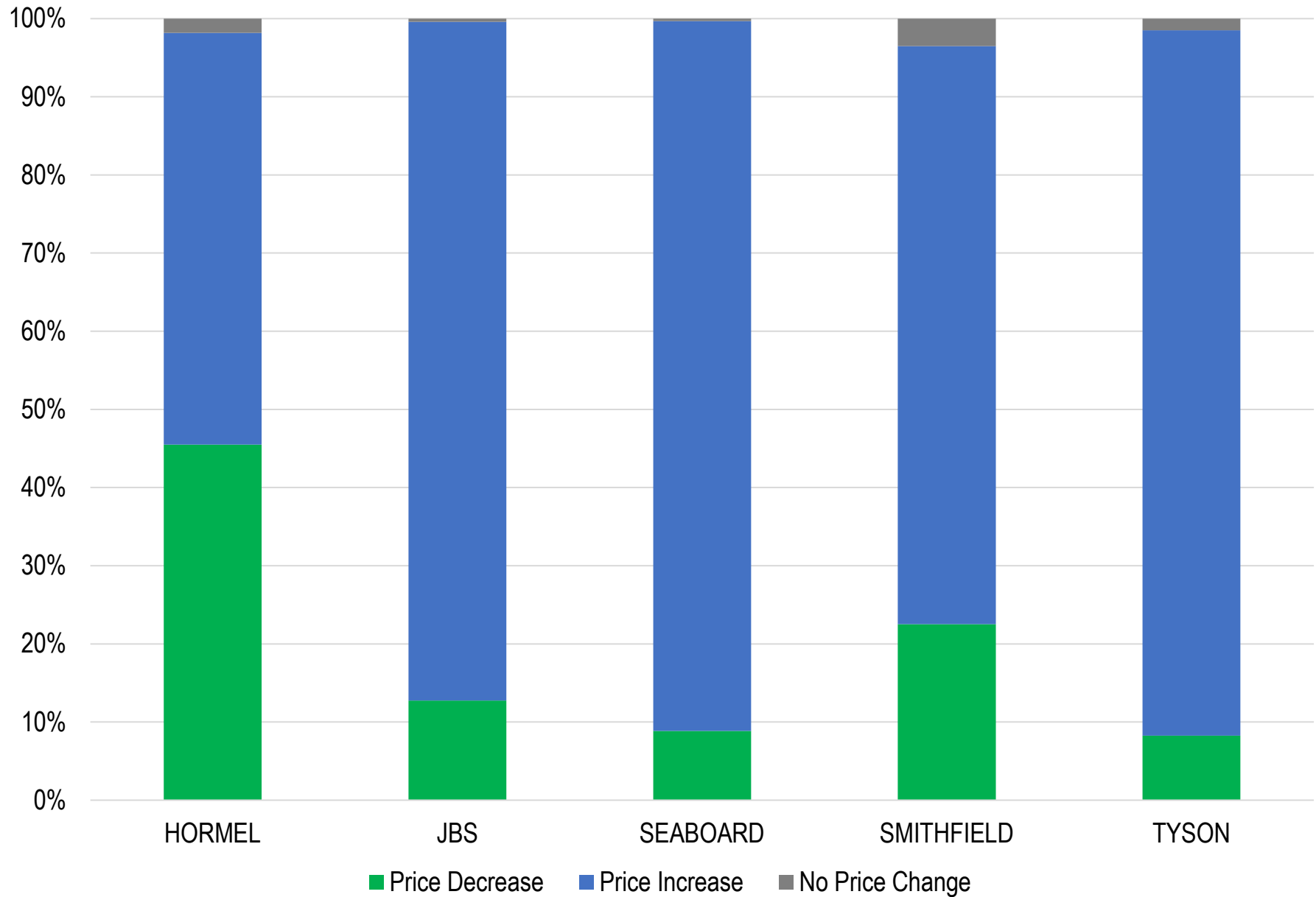
Appendix C - 5
Modified Dr. Haider's Price Response Analysis
Effects of the Alleged Conspiracy on Fresh Ham Products
Starting in January – June 2010, +/- 6 months
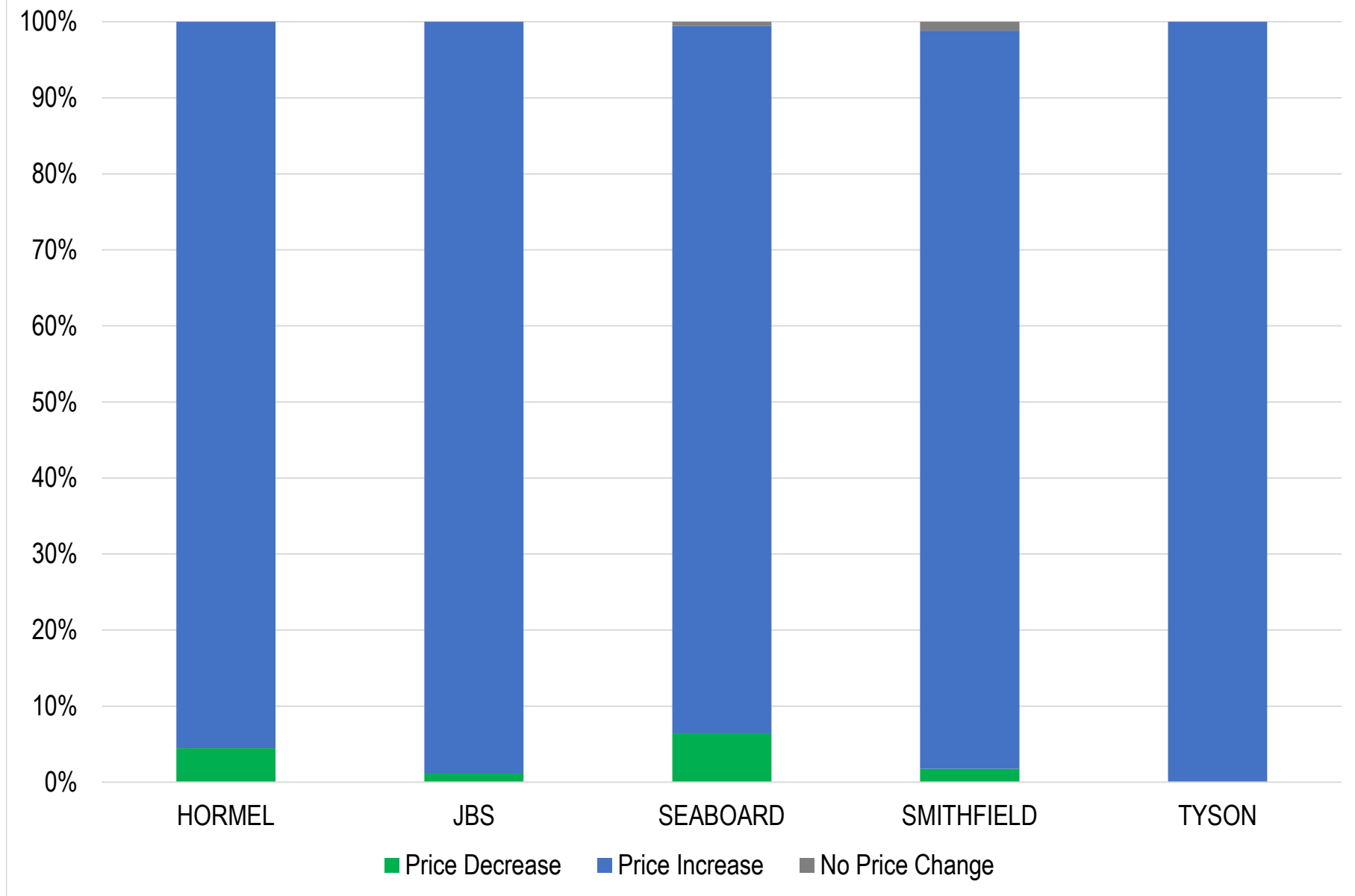
Appendix C - 6
Modified Dr. Haider's Price Response Analysis
Effects of the Alleged Conspiracy on Loin Products
Starting in January – June 2010, +/- 6 months
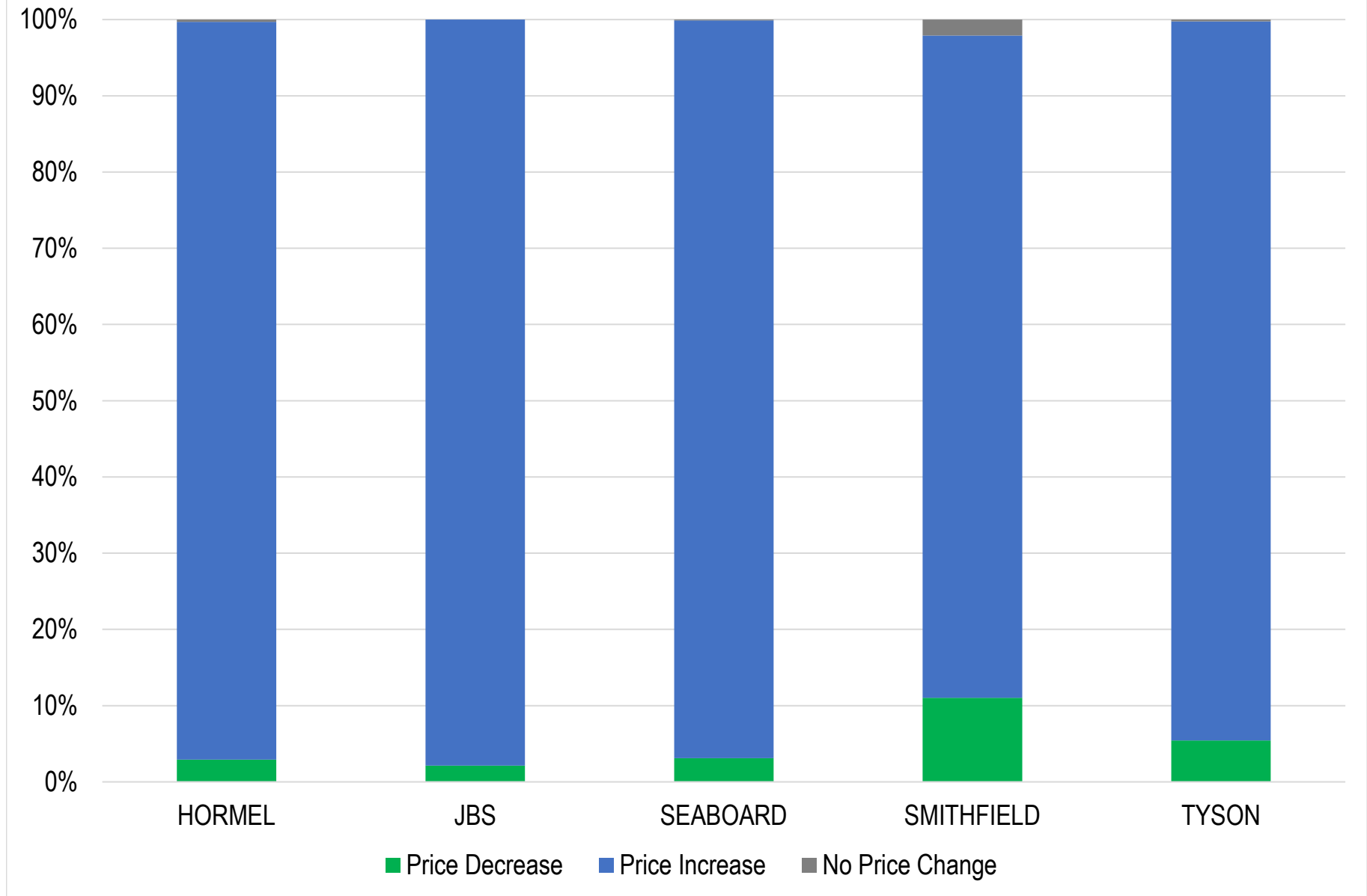
Appendix C - 7
Modified Dr. Haider's Price Response Analysis

Effects of the Alleged Conspiracy on Shoulder Products
Starting in January – June 2010, +/- 6 months

Appendix C - 8
Modified Dr. Haider's Price Response Analysis
Effects of the Alleged Conspiracy on Ribs Products
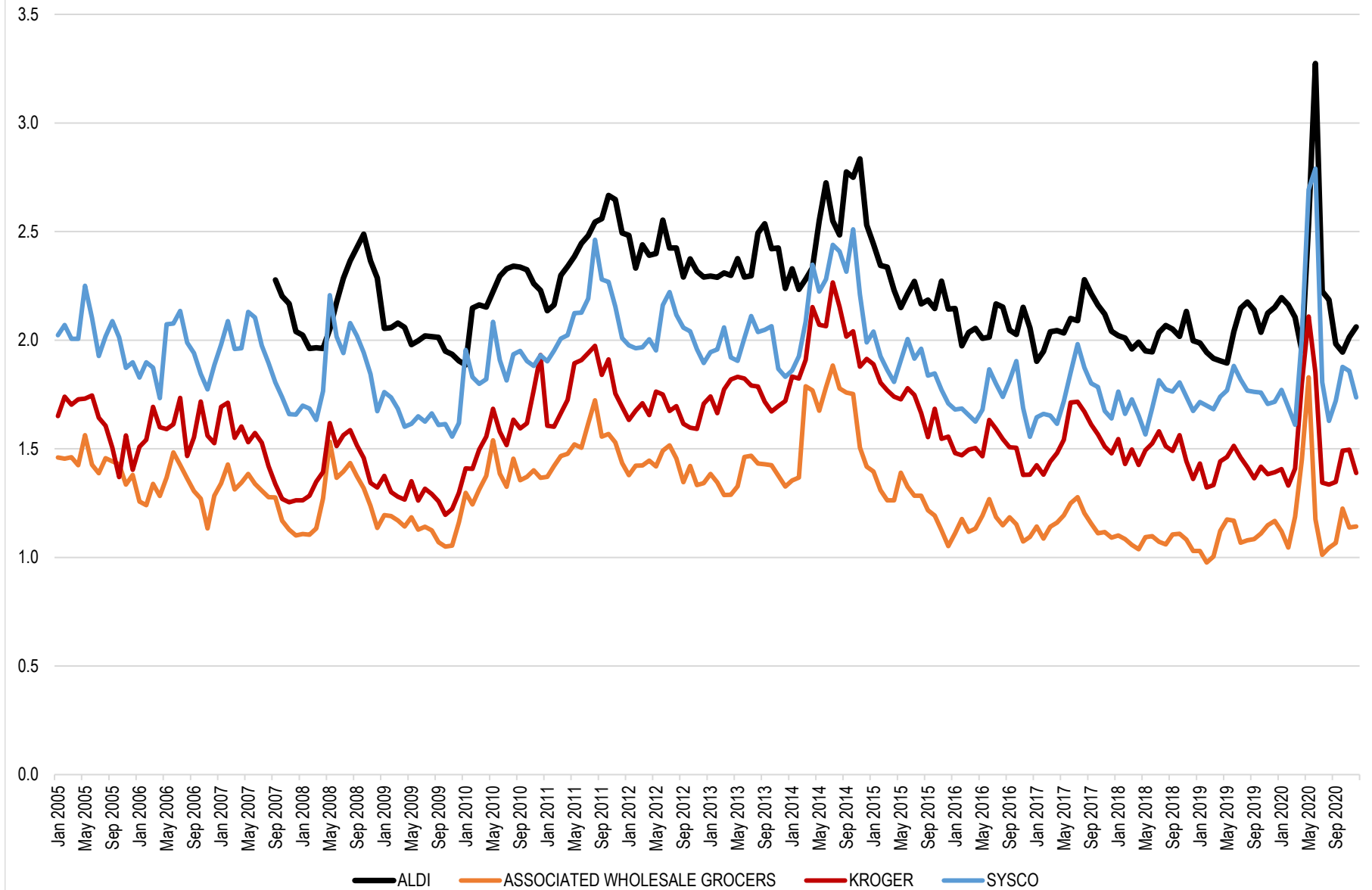**Starting in January – June 2010, +/- 6 months**
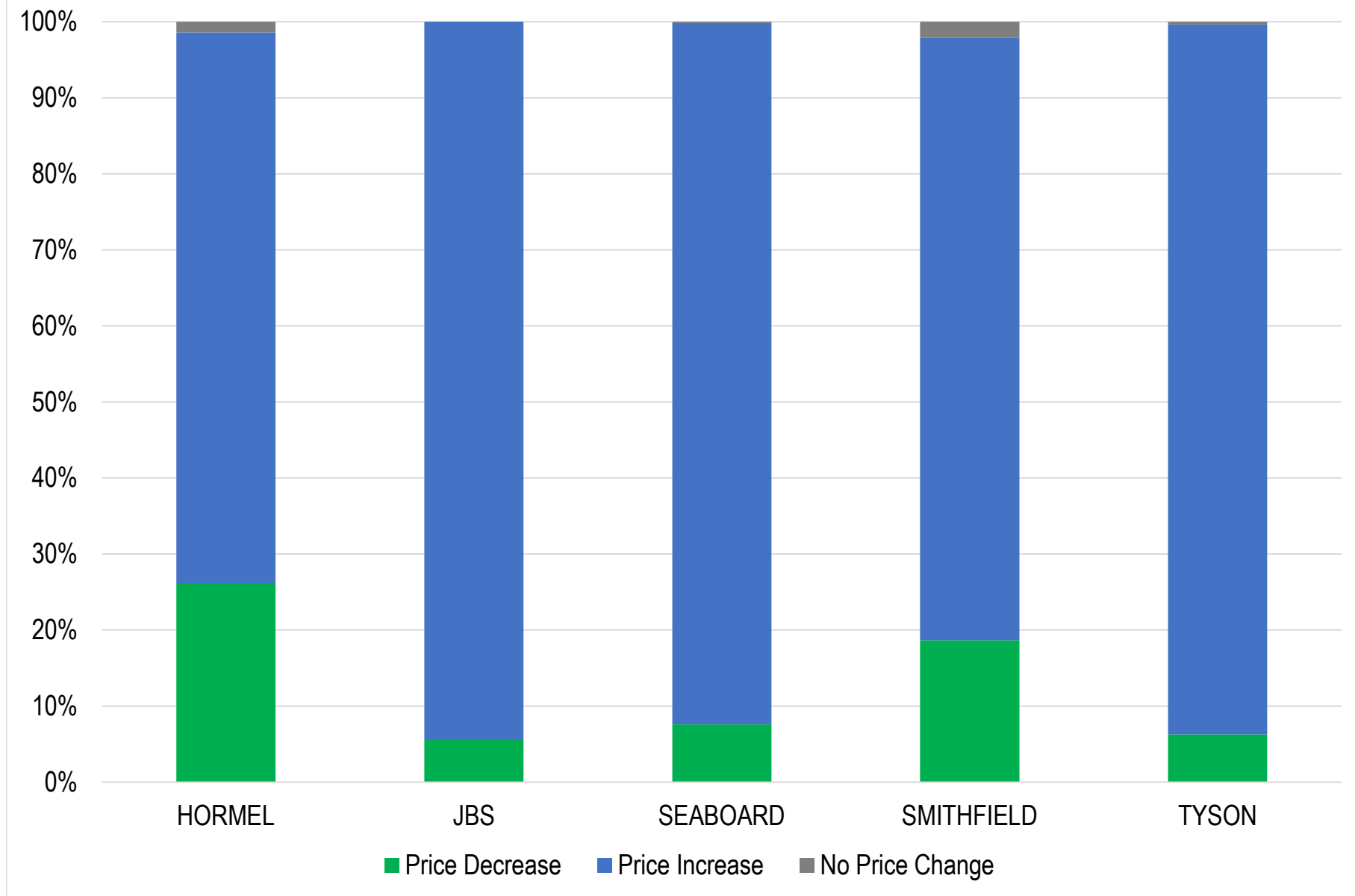
APPENDIX D

Appendix D - 1

Aldi Bacon Price Compared to that of Customers
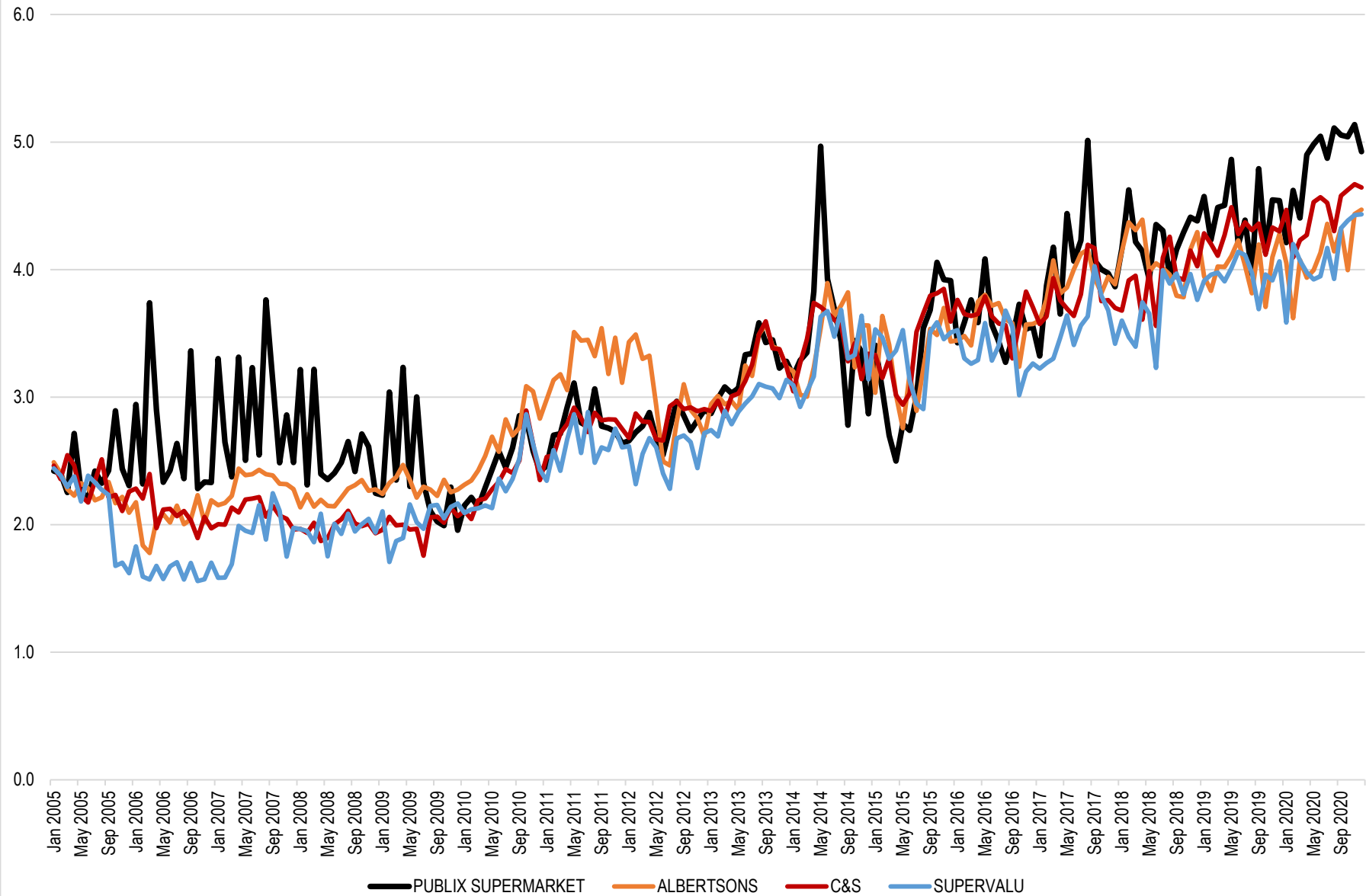with Positive and Statistically Significant Overcharges in Dr. Haider Exhibit 31
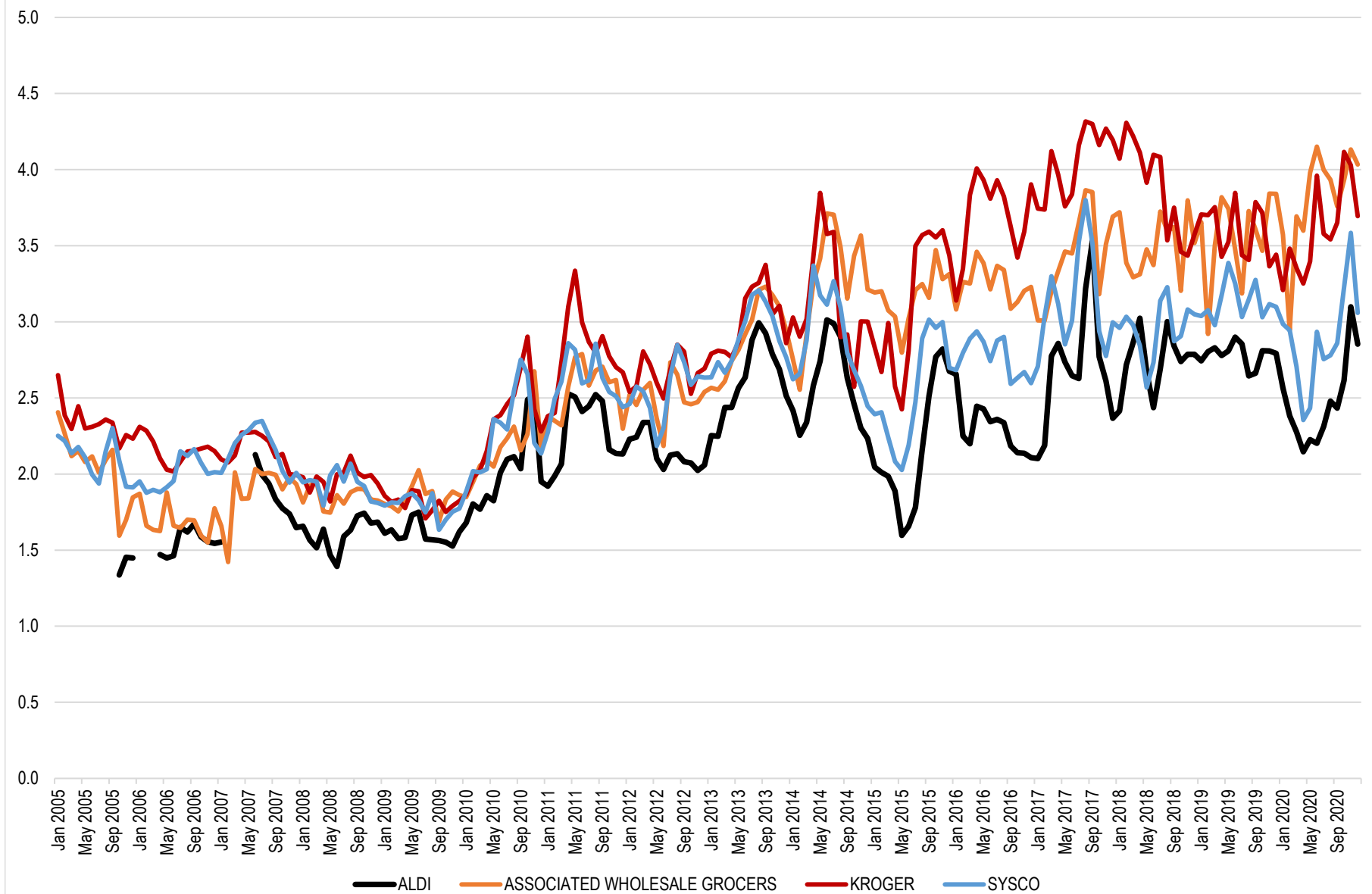
Appendix D - 2

**Aldi Loin Price Compared to that of Customers
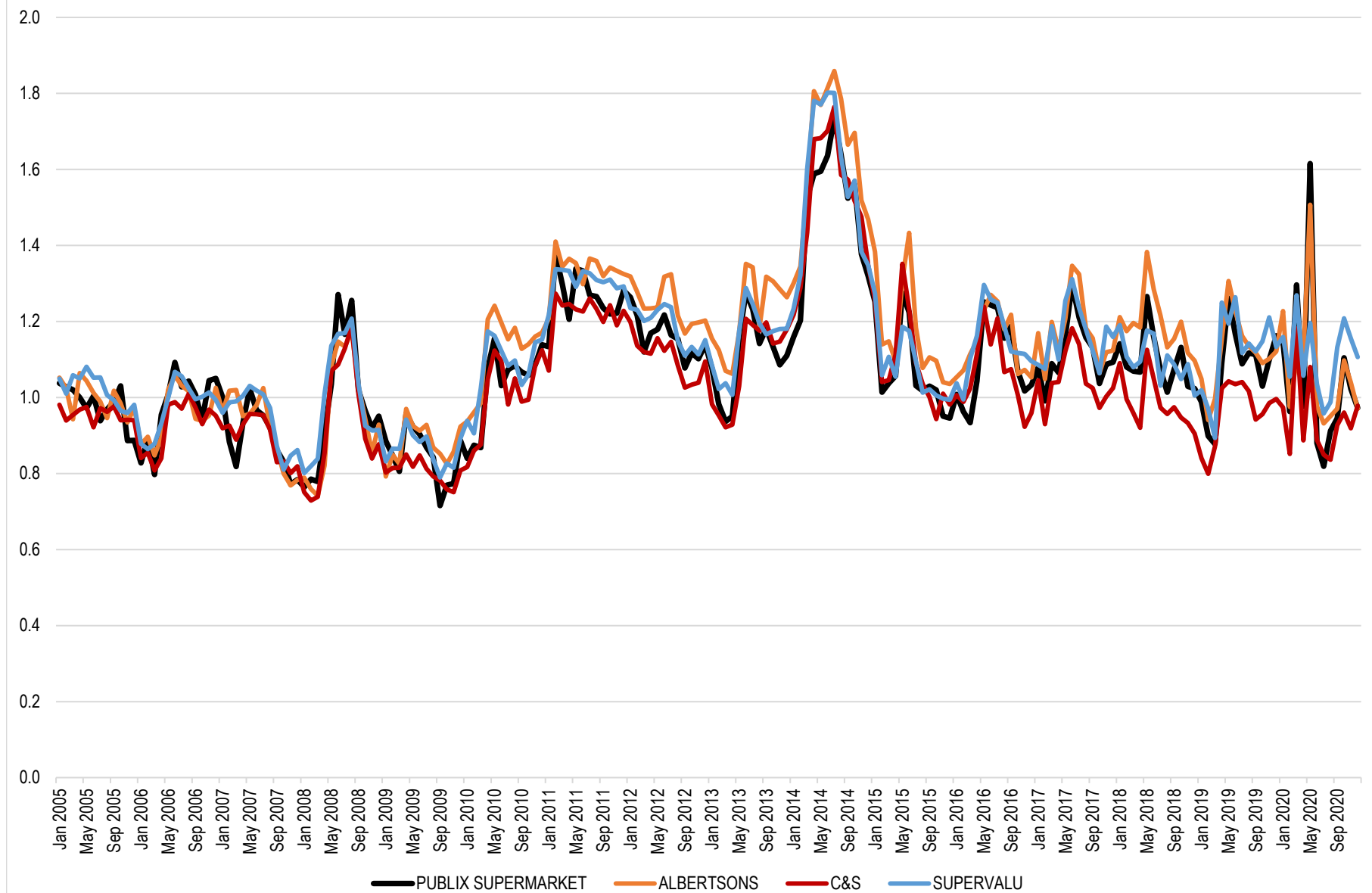with Positive and Statistically Significant Overcharges in Dr. Haider Exhibit 31**

Appendix D - 3

**Publix Supermarket Bacon Price Compared to that of Customers
with Positive and Statistically Significant Overcharges in Dr. Haider Exhibit 31**
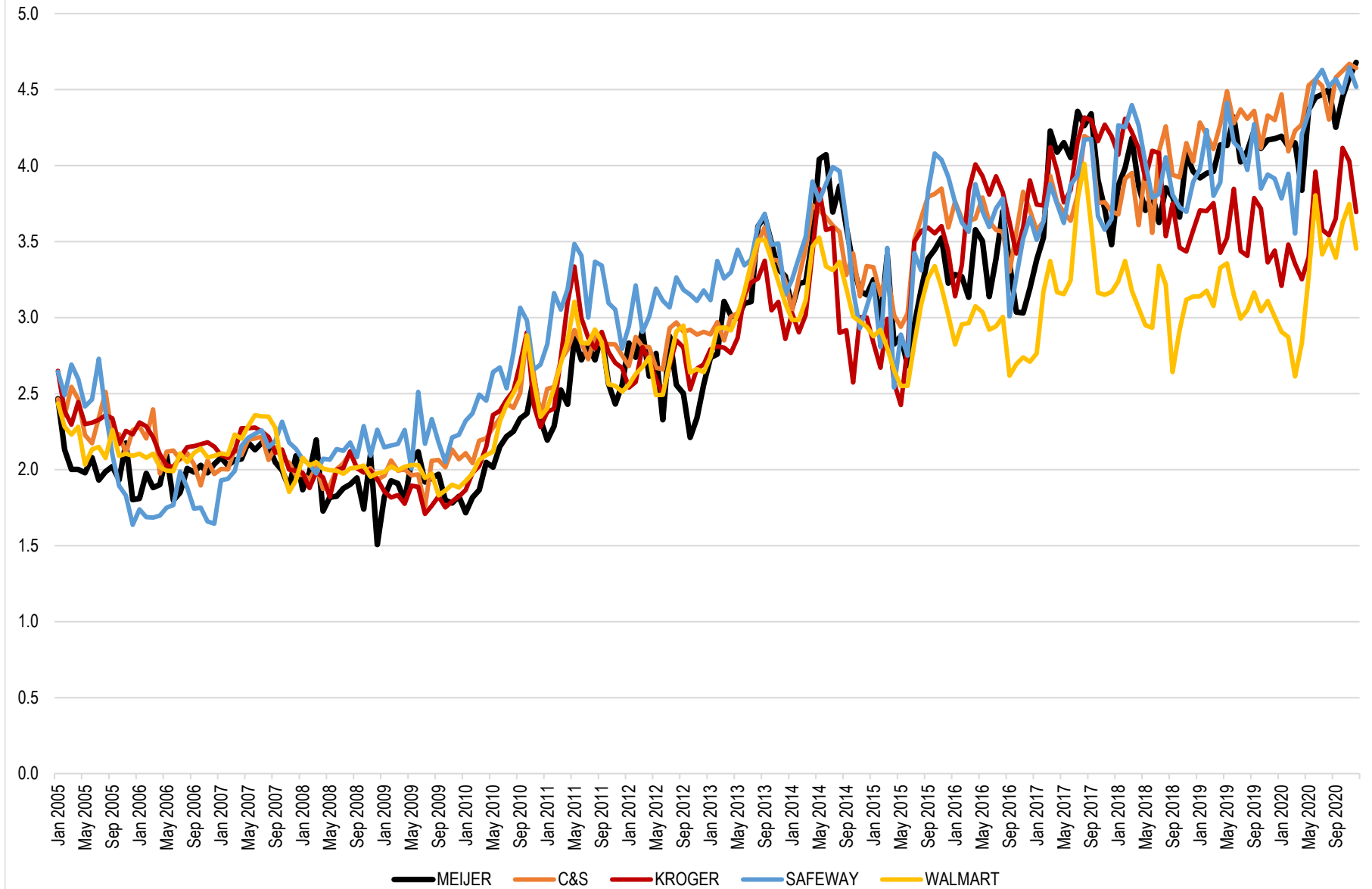
Appendix D - 4

Publix Supermarket Shoulder Price Compared to that of Customers
with Positive and Statistically Significant Overcharges in Dr. Haider Exhibit 31

Appendix D - 5

**Publix Supermarket Loin Price Compared to that of Customers
with Positive and Statistically Significant Overcharges in Dr. Haider Exhibit 31**
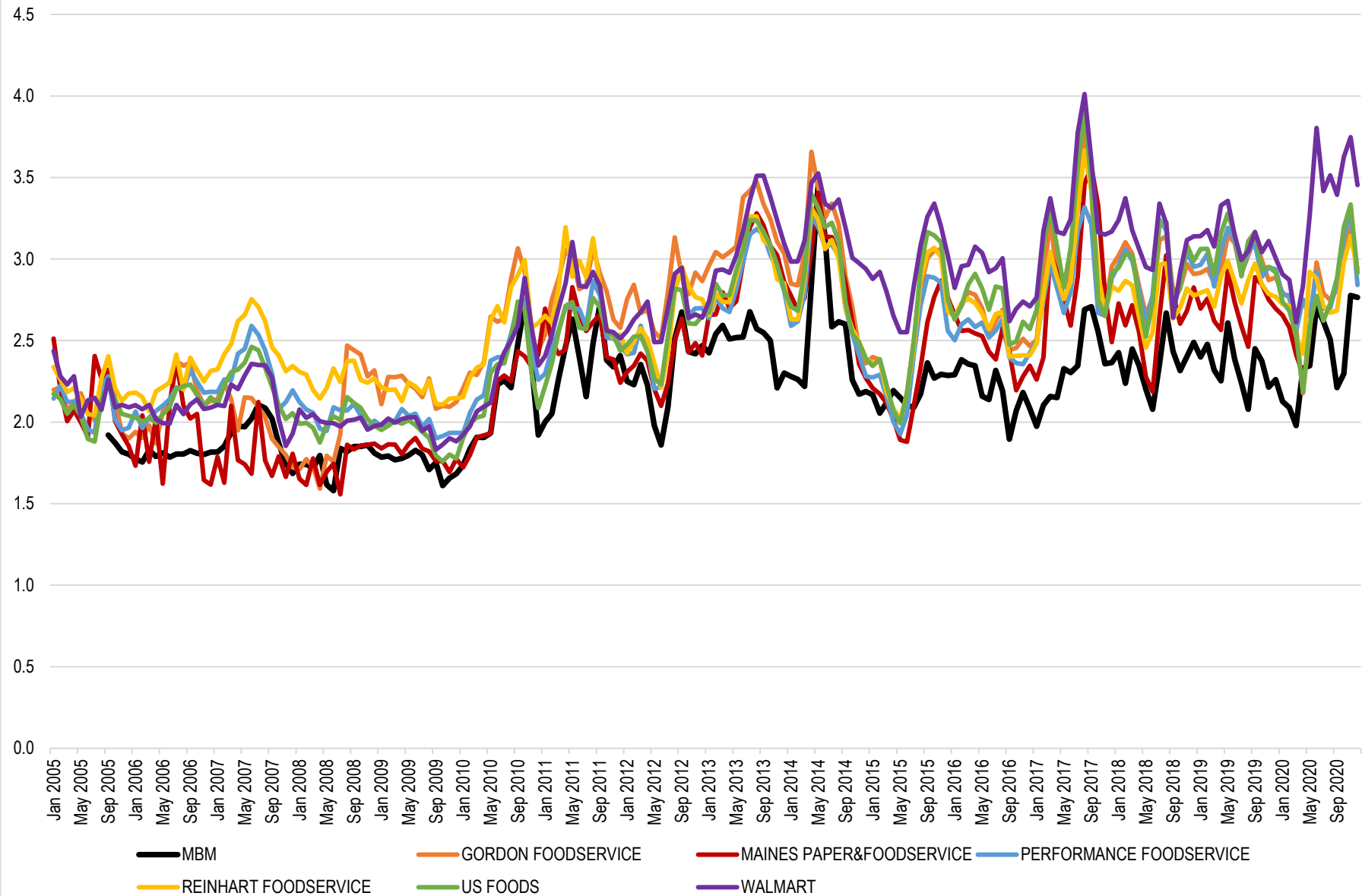
Appendix D - 6

**Meijer Bacon Price Compared to that of Customers
with Positive and Statistically Significant Overcharges in Dr. Haider Exhibit 31**

Appendix D - 7

**MBM Bacon Price Compared to that of Customers
with Positive and Statistically Significant Overcharges in Dr. Haider Exhibit 31**

Appendix D - 8

Aldi Bacon Correlations
With Other Customers with Positive and Statistically
Significant Overchargres

from Dr. Haider's Exhibit 31 Analysis

Cut	Customer	Correlation
BACON	ASSOCIATED WHOLESALE GROCERS	0.83
BACON	KROGER	0.83
BACON	SYSCO	0.92

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Aldi Loin Correlations
With Other Customers with Positive and Statistically
Significant Overchargres

from Dr. Haider's Exhibit 31 Analysis

Cut	Customer	Correlation
LOIN	ASSOCIATED WHOLESALE GROCERS	0.71
LOIN	KROGER	0.71
LOIN	SYSCO	0.82

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Publix Supermarket Bacon Correlations
With Other Customers with Positive and Statistically
Significant Overchargres

from Dr. Haider's Exhibit 31 Analysis

Cut	Customer	Correlation
BACON	ALBERTSONS	0.83
BACON	C&S	0.89
BACON	SUPERVALU	0.84

Appendix D - 11

Publix Supermarket Shoulder Correlations
With Other Customers with Positive and Statistically
Significant Overchargres

from Dr. Haider's Exhibit 31 Analysis

Cut	Customer	Correlation
SHOULDER	ALBERTSONS	0.95
SHOULDER	C&S	0.92
SHOULDER	SUPERVALU	0.93

Appendix D - 12

Publix Supermarket Loin Correlations
With Other Customers with Positive and Statistically
Significant Overchargres

from Dr. Haider's Exhibit 31 Analysis

Cut	Customer	Correlation
LOIN	ALBERTSONS	0.84
LOIN	C&S	0.83
LOIN	SUPERVALU	0.83

Appendix D - 13

Meijer Bacon Correlations
With Other Customers with Positive and Statistically
Significant Overchargres

from Dr. Haider's Exhibit 31 Analysis

Cut	Customer	Correlation
BACON	C&S	0.96
BACON	KROGER	0.91
BACON	SAFEWAY	0.93
BACON	WALMART	0.91

Appendix D - 14

MBM Bacon Correlations
With Other Customers with Positive and Statistically
Significant Overchargres

from Dr. Haider's Exhibit 31 Analysis

Cut	Customer	Correlation
BACON	GORDON FOODSERVICE	0.83
BACON	MAINES PAPER&FOODSERVICE	0.85
BACON	PERFORMANCE FOODSERVICE	0.84
BACON	REINHART FOODSERVICE	0.82
BACON	US FOODS	0.81
BACON	WALMART	0.84